
CDC® CYBER CHANNEL COUPLER
19404-1/2/3/10/11/12

CDC CYBER Channel Coupler

19404-1/2/3/10/11/12

Hardware Maintenance Manual

This product is intended for use only as described in this document. Control Data cannot be responsible for the proper functioning of undescribed features and parameters.

Manual History

Technical changes and additions are indicated by vertical change bars in the margins.

Revision	Change Order	Date	Reason for Change
A	—	February 1990	Manual released.
B	51017	August 1990	Manual updated to reflect four logic modules affected by Engineering Change Order 51017 and miscellaneous changes.
C	51232	November 1990	Manual updated to reflect two logic modules affected by Engineering Change Order 51232. New logic prints included for modules A02 and A10.
D	51418	March 1991	Manual updated to ensure input voltage jumper J1 on power supply of 19404-2/11 CCC is set properly prior to initial startup. Incorporates TARs 2310 and 2311.
E	51479	January 1992	Manual updated to reflect hardware changes to logic boards and wiring changes to the backpanel. Corrects data integrity problems encountered on 7990/7992 mass storage and 5680 cartridge tape products.

Revision letters I, O, Q, S, X, and Z are not used.

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Equipment Supported in This Manual

This manual supports the following equipment at the series levels listed, assuming all field change orders (FCOs) against the equipment have been installed. Compare the list of FCOs in this table with the list in your equipment FCO log. If the two lists match, this manual accurately reflects your equipment.

Equipment	Series	FCOs	Comments
19404-1	NA	51017	
19404-2	NA	51017	
19404-3	NA	51017	
19404-10	NA	51017	
19404-11	NA	51017	
19404-12	NA	51017	

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About This Manual

This manual provides hardware maintenance information for the CONTROL DATA® 19404-1, 19404-2, 19404-3, 19404-10, 19404-11, and 19404-12 CYBER Channel Coupler (called the CCC or the coupler in this manual). The 19404-1, 19404-2, 19404-10, or 19404-11 are the basic CCCs, while the 19404-3 or 19404-12 are optional couplers that mounted within the same cabinet.

Organization

The information in this manual is organized under the following major chapters and appendixes.

- Chapter 1 – General Description
- Chapter 2 – Operation
- Chapter 3 – Installation and Checkout
- Chapter 4 – Theory of Operation
- Chapter 5 – Diagrams
- Chapter 6 – Maintenance
- Chapter 7 – Structured-Analysis Method (SAM)
- Chapter 8 – Removal/Replace/Adjustment Procedures
- Chapter 9 – Parts Data
- Chapter 10 – Wire Lists
- Appendix A – CYBER Channel Trace Tables

Conventions

All numbers are assumed decimal unless otherwise noted.

Technical changes and additions are indicated by change bars and are correlated with the revision of the page on which they occur. Other changes, such as editorial and pagination, are not identified by change bars but may be included as part of a revision.

Disclaimer

The installation and checkout information is valid only as described in this manual and other referenced manuals and documents. Control Data cannot be responsible for problems that result from improper installation and checkout. If any information in this manual conflicts with local building, electrical, or fire codes or ordinances, the customer should consult with local authorities on these matters.

It is the customer's responsibility to ensure that applicable building, electrical, and fire codes or ordinances are followed.

Electromagnetic Interference Compliance

The CYBER 2000 Computer System has been tested for compliance with class A electromagnetic (EMI) standards of Canada, Germany, and the United States of America.

Canada Compliance

This digital apparatus does not exceed the class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

LE PRESENT APPAREIL NUMERIQUE N'EMET PAS DE BRUITS
RADIOELECTRIQUES DEPASSANT LES LIMITES APPLICABLES AUX APPAREILS
NUMERIQUES DE CLASSE A PRESCRITES DANS LE REGLEMENT SUR LE
BROUILLAGE RADIOELECTRIQUE EDICTE PAR LE MINISTERE DES
COMMUNICATIONS DU CANADA.

USA Compliance

This equipment generates radio frequency energy which may cause interference to radio communications if the equipment is not installed and operated in accordance with manufacturer's instructions. Changes or modifications to the equipment which are not expressly approved by the manufacturer could void the user's authority to operate the equipment.

This equipment complies with the limits for a class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against interference of radio communications when this equipment is operated in a commercial environment. This equipment may cause interference if operated in a residential area; in which case, it is the user's responsibility to correct interference problems.

Related Manuals

Manual Title	Publication Number
698 CYBER Magnetic Tape Subsystem (CMTS) User's Guide	60000009
7990-31/7992-10 CDC Tape Storage Subsystem Reference Manual	60000423
5680 CYBER Cartridge Tape Subsystem (CCTS) User's Guide	60000456
5744 Automated Cartridge Subsystem (ACS) User's Guide	60000459
CYBER Channel Coupler 19404-1/2/3/10/11/12 Hardware Reference Manual	60000495
Computer Systems Site Preparation Peripheral Data	60275300
TTL Key to Logic Symbols Customer Engineering Manual	60406000
Concurrent Maintenance Library (CML) Reference Manual	60455980
MSL Offline Maintenance Software Library Reference Manual	60456530
NOS 2 Installation Handbook	60459320
Hardware Performance Analyzer (HPA) User's Reference Manual	60459460

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If you have access to SOLVER, the Control Data facility for reporting problems, you can use it to submit comments about the manual. When entering your comments, use NV0 (zero) as the product identifier. Include the name and publication number of the manual.

General Description

1

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The CDC® CYBER Channel Coupler (CCC) contains the hardware necessary to connect a CDC CYBER 170/180 Computer System to an attached peripheral subsystem that meets the requirements of a Federal Information Processing Standards (FIPS) device. The CCC requires that unique microcode be loaded into its memory for each type of peripheral subsystem it controls (for example, disk, tape, or printer subsystems). Refer to separate peripheral subsystem user guides listed in About This Manual for controlware information applicable to the type of subsystem being used.

Refer also to the CYBER Channel Coupler 19404-1/2/3/10/11/12 Hardware Reference Manual listed under Related Manuals in About This Manual for information on the CYBER 170/180 peripheral processor programming functions applicable to the CCC.

Product Descriptions

The following paragraphs describe the differences between the various CYBER channel coupler products. Each coupler provides the hardware connection between a CYBER 170 computer I/O channel and a Federal Information Processing Standard (FIPS) compatible device. Each type of FIPS device requires different operating controlware.

- **19404-1 CCC:** This product can be ordered without a CDC peripheral subsystem. The coupler includes a cabinet assembly that requires 400-Hz input power. This product does not include cables or terminators for the peripheral device. Cables and terminators must be provided by the peripheral supplier.
- **19404-2 CCC:** This product can be ordered without a CDC peripheral subsystem. The coupler includes a cabinet assembly that requires 50/60-Hz input power. This product does not include cables or terminators for the peripheral device. Cables and terminators must be provided by the peripheral supplier.
- **19404-3 CCC upgrade:** This product can be ordered without a CDC peripheral subsystem. This product does not include cables or terminators for the peripheral device. Cables and terminators must be provided by the peripheral supplier. The 19404-3 CCC upgrade which is housed in either a 19404-1 or 19404-2 CYBER channel coupler cabinet, consists of logic cards that comprise an additional coupler.
- **19404-10 CCC:** This product cannot be ordered by itself; it must be ordered with a 5680-11 CYBER cartridge tape subsystem (CCTS) control unit or a 7990-31 or 7992-10 MASSTOR control unit. This product includes a cabinet assembly which requires 400-Hz input power.
- **19404-11 CCC:** This product cannot be ordered by itself; it must be ordered with a 5680-11 CCTS control unit or a 7990-31 or 7992-10 MASSTOR control unit. This product includes a cabinet assembly which requires 50/60-Hz input power.
- **19404-12 CCC upgrade:** This product cannot be ordered by itself; it must be ordered with a 5680-11 CCTS control unit or a 7990-31 or 7992-10 MASSTOR control unit. The 19404-12 upgrade which is either housed in a 19404-10 or 19404-11 CCC cabinet, consists of logic cards that comprise an additional coupler.

Hardware Configuration

The CYBER Channel Coupler (CCC) connects to a peripheral processor (PP) channel of a CYBER 170/180 Computer System and a FIPS-compatible disk, tape, or printer subsystem. The coupler consists of a data bus, processor, random-access memory (RAM), programmable read-only memory (PROM), CYBER channel interface, FIPS device interface, FIPS power-control circuit, and transfer logic. These elements are shown in block diagram form in figure 1-1 and described in the following paragraphs.

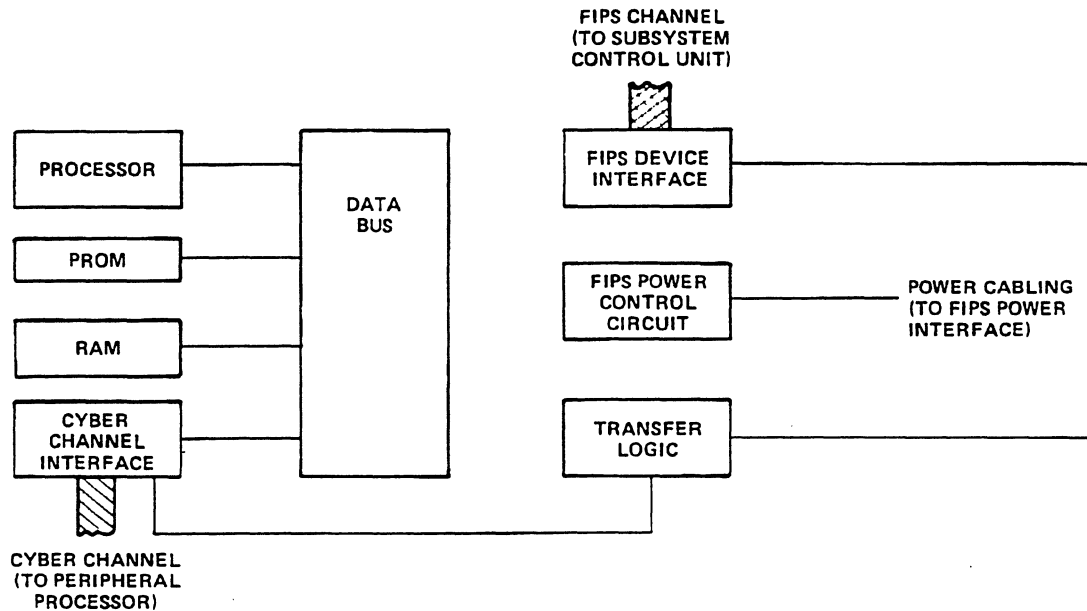


Figure 1-1. Coupler Block Diagram

Data Bus

The data bus interconnects the various components (processor, CYBER channel interface, FIPS device interface, RAM, and PROM) of the coupler. Utilization of the data bus is divided equally between the processor, CYBER channel interface, and the FIPS device interface.

Processor

The processor is an internally programmed, 16-bit device that decodes function commands from the PP and issues instructions that allow the functions to be performed. The processor consists of two major sections: a control section and an arithmetic section. The control section processes the function commands and sequences the various instructions. The arithmetic section performs all related arithmetic operations.

Random-Access Memory (RAM)

The RAM contains 65 536 words of memory having a maximum read access time of 85 nanoseconds. Each word is 16 bits in length. The addresses available for use are 0000 through FFFF_{16} , however, some locations above 7FFF_{16} are not accessible. The microcode program is loaded into RAM from the PP for subsequent use by the processor.

Programmable Read-Only Memory (PROM)

The PROM contains 4096 16-bit words; the addresses available for use are 8000_{16} through 8FFF_{16} . Firmware consisting of autoloading functions and internal diagnostics is permanently coded in the PROM.

CYBER Channel Interface

The CYBER channel interface links the CYBER 170/180 PP channel to the processor and memory of the coupler. This PP channel is connected to the coupler via two 19-pin coaxial cables. All functions received from the PP (except the x5xx and x7xx diagnostic functions or functions that contain a channel parity error) are routed to the processor. The processor decodes the function and directs the CYBER channel interface to respond to the function. No response is sent to the PP if a parity error is detected.

After sending an inactive signal to the PP channel in response to a function, the CYBER channel interface waits for the processor to inform it as to the type of write or read operation that will follow (if any).

The CYBER channel interface performs six different functions under the direction of the processor, and seven diagnostic functions without processor direction. Refer to the CYBER Channel Coupler 19404-1/2/3/10/11/12 Hardware Reference Manual for detailed information on these functions.

Federal Information Processing Standard (FIPS) Device Interface

The FIPS device interface contains the receivers, transmitters, and control logic to drive the attached peripheral subsystem. It also provides code translation and block ID generation for tape control units.

The FIPS device interface does not use any interrupts. Therefore, no interrupt logic is connected and all logic associated with interrupts is disabled where possible.

Federal Information Processing Standard (FIPS) Power Control Circuit

The FIPS power control circuit controls the power sequencing of the attached peripheral devices by applying and removing power in sequential steps. This stepping of power (on or off) decreases the overall system power requirements and power surge noise generation. Two FIPS power control switches are provided on the power control panel to power two separate equipment chains. Each switch controls the power sequence to its respective peripheral device in accordance with the FIPS Channel Level Power Control Interface standard.

Transfer Logic

The transfer logic provides the necessary hardware to transfer data from the CYBER channel interface through memory to the FIPS device interface. This is accomplished through buffer registers. During the transfer, data is written into a 16-Kbyte buffer by one interface and read from that buffer by the other interface.

Physical Description

Figures 1-2 and 1-3 show the major components of a 19404-10 and 19404-11 CCC, respectively. A brief description of CCC components follows.

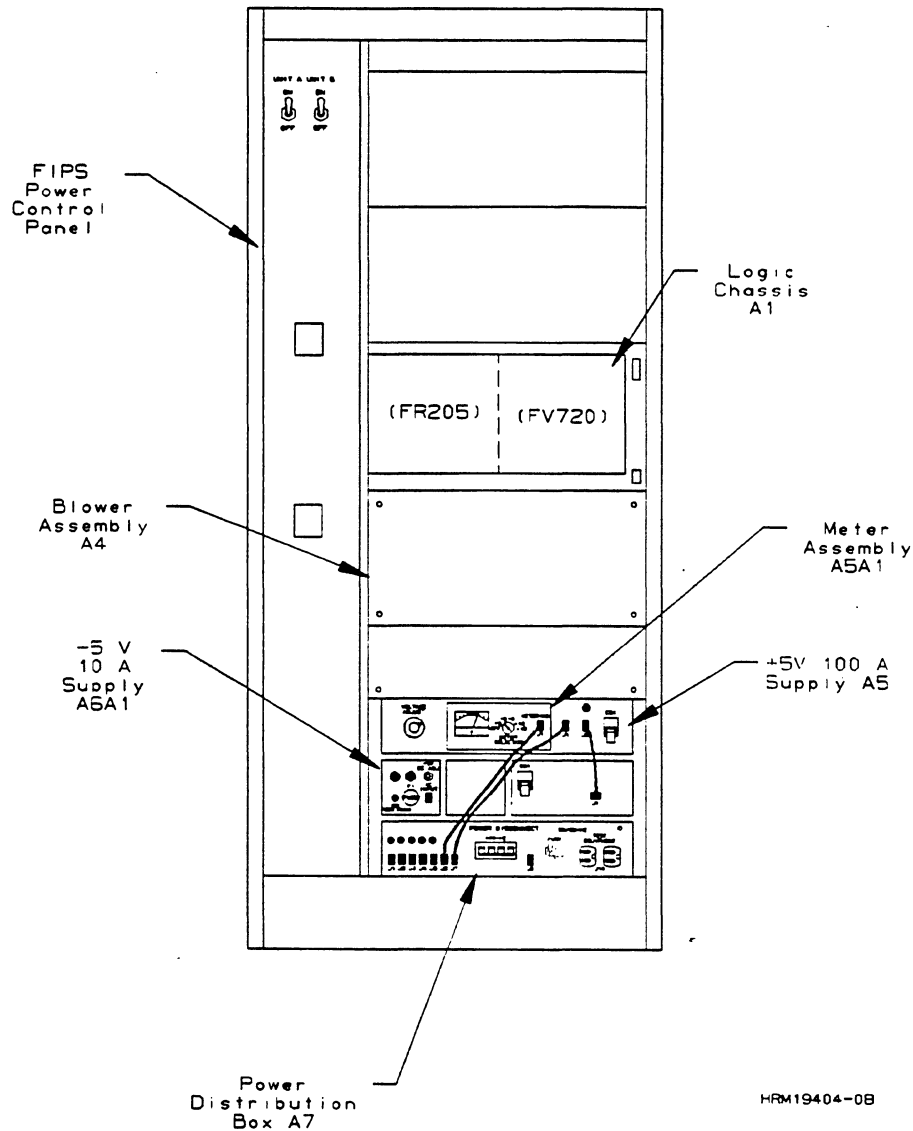


Figure 1-2. 19404-1/10 CCC Components

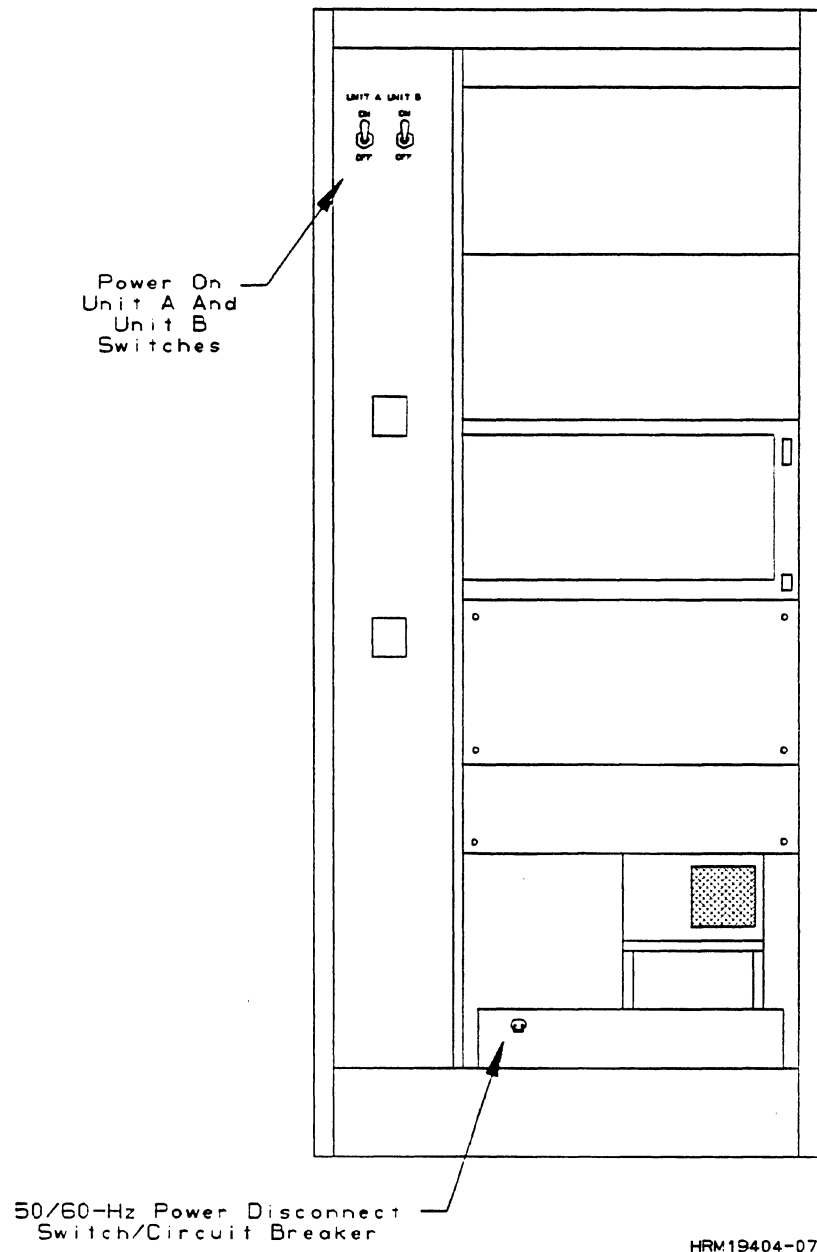


Figure 1-3. 19404-2/11 CCC Components

19404-1/2/10/11 Cabinet

The 19404-1/2/10/11 coupler is housed in a single-wide trimline cabinet. Doors and removable panels provide access to internal components for maintenance. A cooling blower in the base of the cabinet draws room air through a filter, circulates it around the power supplies and logic modules, and forces the air out exhaust ducts in the top of the cabinet.

The cabinet for the basic 19404-1/2/10/11 coupler can accommodate an additional coupler as an option. The optional 19404-3/12 coupler consists of logic cards only. The cabinet is prewired for an optional coupler.

19404-1/10 Power Supplies

Most power-supply components of a 19404-10 CCC are located near the base of the cabinet. The coupler contains a -5 and +5-V dc power supply, which operate from 120/208-V, 400-Hz, 3-phase input power. A vertical bus bar carries the +5-V source to the logic chassis, while the -5-V source is routed directly to the logic chassis via a terminal board.

The blower operates from 120-V, 50/60-Hz, 1-phase power. The blower housing contains an airflow sensor to shut down the 400-Hz power in case of excessively low air flow.

19404-2/11 Power Supply

The 19404-2/11 power supply, which is located near the base of the cabinet, provides output voltages of -5 and +5-V dc. It operates from 220/240-V, 50/60-Hz, 1-phase input power. A vertical bus bar carries the +5 V to logic chassis and the -5 V is routed directly to the logic chassis from a terminal board.

The blower operates from 120-V, 50/60-Hz, 1-phase power. The blower housing contains an airflow sensor to shut down the power supply in case excessively low air flow.

Logic Chassis

The logic chassis contains a fiberglass backpanel with exposed wire-wrapped pins. These pins, which protrude from the rear of the backpanel, pass through to the front of the backpanel where they are attached to connectors. Logic modules slide into card guides at the front of the logic chassis and interconnect with the backpanel connectors via edge connectors on the rear of each logic card.

Logic Modules

The coupler logic is contained on 70-pak, printed-circuit logic modules. Up to 70 integrated circuits (ICs) are mounted on each logic module in a 5-by-14 IC matrix.

Two 90-pin connectors are located on the rear edge of the logic module. The upper 90-pin connector has pin designations of P1A01 through P1A45 (from top to bottom) on one side of the module and P1B01 through P1B45 on the other side. The lower 90-pin connector has similar pin designations, but they are allocated as P2A01 through P2A45 and P2B01 through P2B45.

Test points are located on the front edge of each logic module. The test points are designated as 01 through 51 from top to bottom on the module.

Logic Types

The coupler logic modules use transistor-transistor logic (TTL) ICs. The TTL circuits are packaged in 14-, 16-, or 20-pin dual inline ICs. The TTL logic levels are +2.0 to +3.3 V for a high (logical 1) and +0.2 to +0.8 V for a low (logical 0).

Signal Connections

Signals between logic modules are transmitted via the wire-wrapped interconnections on the logic chassis backpanel. Signal connections from the FIPS device interface connectors use twisted-pair wires that are wire-wrapped to the backpanel pins. Signal connections from the CYBER channel interface connectors use twisted-pair wires that insert into plastic block connectors; the plastic block connectors fit over the backpanel pins.

19404-1/2/10/11 Maintenance Board

A maintenance board at location A14 is provided to read the memory locations of either coupler that may be installed in the cabinet. A thumbwheel on the board is used to specify the desired memory address. Contents of the specified memory address are displayed in hexadecimal in four groups of four board-mounted lightemitting diodes (LEDs).

19404-1/2/10/11 FIPS Power Control Panel

The FIPS power control panel contains two power switches and connectors that control application of power to two separate peripheral device chains. Power is applied in a specific control sequence as directed by applicable Federal Interface Processing Standards.

Functional Description

The CCC is driven by a CYBER 170/180 series PP. Each coupler can be accessed by only one PP channel. All communication between the PP and the coupler is initiated by 12-bit function codes from the PP. The upper three bits of each 12-bit function code identifies the peripheral subsystem controller connected to the coupler. The coupler microcode converts PP functions into commands that control the attached peripheral subsystem. The coupler microcode also converts incoming subsystem status conditions into general and detailed status for use by the host operating system. Each function has an approximate PP timeout of 1 second(s) to avoid hanging the channel in a full condition should a hardware logic failure occur. The coupler replies to all legal function codes described in the applicable peripheral subsystem user's guides.

Equipment Specifications

Equipment specifications for the coupler are as follows.

Input Power

Power requirements are shown in the following matrix.

Type	A/Phase	kVA	V ac	Hz	Phase
19404-1/10	9	1.1	120	60	1
	5	0.75	220	50	1
	1.8	0.64	120/208	400	3
19404-2/11	4.9	1.17	240	60	1
	5.3	1.17	220	50	1
	4.9	1.17	240	50	1

Temperature

Operating: 15° to 32°C (59° to 90°F)

Nonoperating: -40° to 60°C (-40° to 140°F)

Relative Humidity

Operating: 20 to 80%

Non-operating: 5 to 95%

Physical Characteristics

Width: 736 mm (29 in)

Depth: 635 mm (25 in)

Height: 1676 mm (66 in)

Weight (19404-1/10): 136 kg (300 lb)

Weight (19404-2/11): 136 kg (300 lb)

Input/Output (I/O) Cable Information

Table 1-1 describes the CCC I/O cables.

Table 1-1. CCC I/O Cables

Cable	Quantity	Cable P/N	Maximum Length
5680-11 Control Unit	2	22143240 ¹	122 m (400 ft)
7990-31/7992-10 Control Unit	2	22143242 ¹	122 m (400 ft)
PP Channel	2	19191600	19.8 m (65 ft)

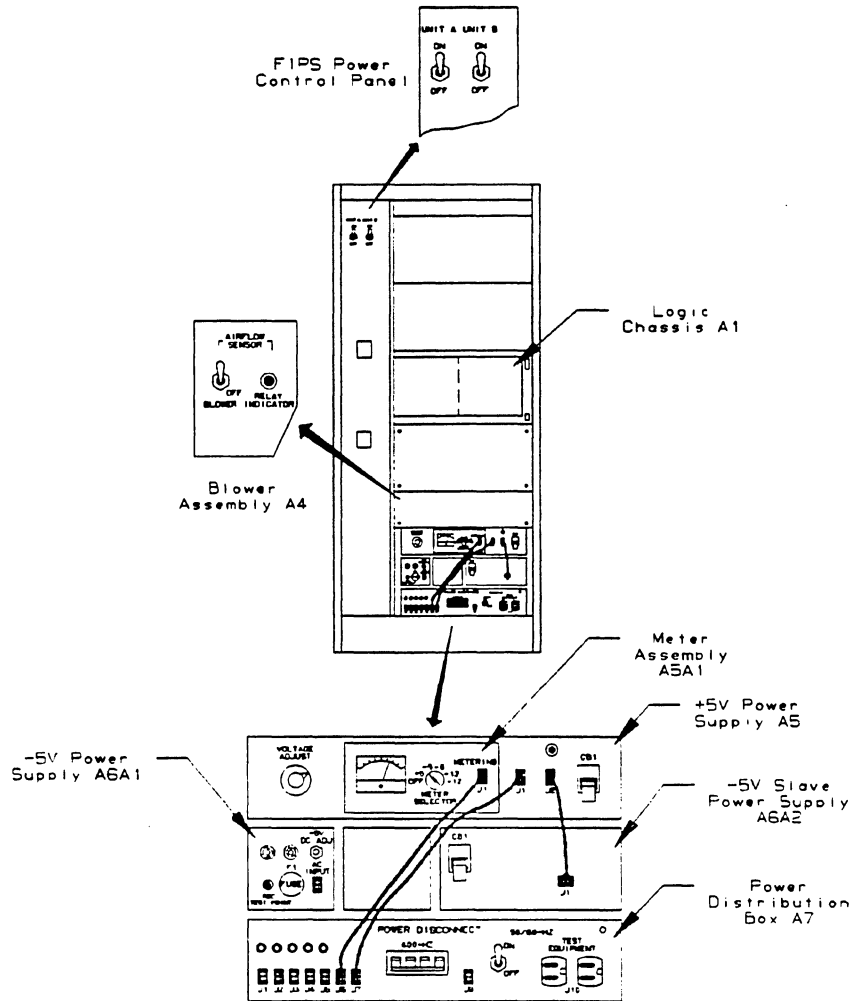
1. These cables are shielded and have a quick-disconnect terminal fastened to the connector panel at each end. Part numbers for various lengths of acceptable shielded cables are listed in appendix A of the Computer Systems Site Preparation Peripheral Data manual.

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CB1 Circuit Breaker (Location A5)	2-3
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This chapter provides information on the controls and indicators of the CYBER Channel Coupler (CCC) and their related operating procedures. For similar information on the various peripheral subsystem devices that may be attached to the coupler, refer to the applicable Control Data publication for that device listed under Related Manuals in About This Manual.

19404-1/10 Panel-Mounted Controls and Indicators

Refer to figure 2-1 for the location of 19404-1/10 CCC controls and indicators which are provided for normal operation, maintenance checks, and adjustments. The panel-mounted controls and indicators used to apply/remove coupler power and perform voltage checks and adjustments are described in the following paragraphs.



HRM19404-1C

Figure 2-1. 19404-10 Panel Controls and Indicators, Front

POWER-ON Indicator

This indicator, located on the extreme, upper left-hand corner of the front cabinet door, remains lit when dc power supplies within the coupler are functioning.

50/60-Hz POWER DISCONNECT Switch

This switch, located on the power distribution panel, applies 50/60-Hz input power to the coupler blower motor when placed in the ON position and removes power from the blower motor when placed in the OFF position.

400-Hz POWER DISCONNECT Switch/Circuit Breaker

This switch/circuit breaker, located on the power distribution panel, applies 400-Hz input power to the coupler power supplies when placed in the ON position and removes this power when placed in the OFF position. The integral circuit breaker provides overload protection to the +5- and -5-V power supplies.

CB1 Circuit Breaker (Location A6A3)

This circuit breaker protects the +5-V power supply at location A6A3 from overload.

Voltage Adjust Control (Location A5)

Manipulate this control only when specifically instructed by a maintenance procedure to adjust the output voltage of the +5-V power supply at location A5.

CB1 Circuit Breaker (Location A5)

This circuit breaker protects the +5-V power supply at location A5 from overload.

Percent Meter (Location A5A1)

This meter indicates a percentage difference of the nominal input voltage for the input dc voltage being monitored. The meter selector switch determines which dc voltage is monitored.

Meter Selector Switch (Location A5A1)

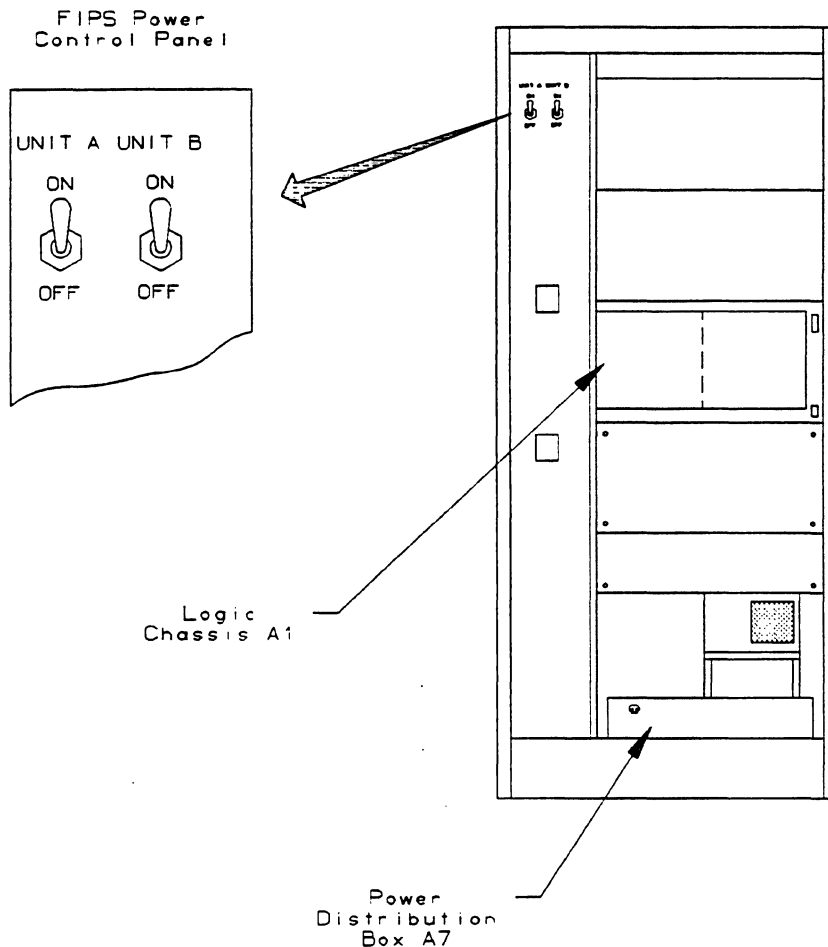
Manipulate this switch to select which dc voltage will be monitored by the percent meter. Only the +5 V and -5 V positions are used.

-5 V dc Adjust Control (Location A6A1)

Manipulate this control when instructed by a maintenance procedure to adjust the output voltage of the -5-V power supply at location A6A1.

19404-2/11 Panel-Mounted Controls and Indicators

Refer to figure 2-2 for the location of 19404-2/11 CCC controls which are provided for normal operation, maintenance checks, and adjustments. The panel-mounted controls and indicators used to apply/remove coupler power and perform voltage checks and adjustments are described in the following paragraphs.



HRM19404-11

Figure 2-2. Front Panel Control and Indicator Locations (19404-2/11)

Power-On Indicator

This indicator, located on the extreme, upper left-hand corner of the front cabinet door, remains lit when dc power supplies within the coupler are functioning.

50/60-Hz POWER DISCONNECT Switch/Circuit Breaker CB1 (Location A7)

This switch/circuit breaker, located on the power distribution panel, applies 50/60-Hz input power to the coupler when placed in the ON position and removes this power when placed in the OFF position. The integral circuit breaker provides overload protection for the entire cabinet.

Power-On UNIT A and B Switches (Power Control Panel)

Activate these switches to apply power in a sequentially stepped fashion to two separate chains of peripheral subsystem devices connected to the CCC. Power sequence circuits regulate the initial subsystem electrical load required by the attached peripherals during power-on.

Location A6A1 FUSE F1

This fuse provides overload protection for the -5-V power supply at location A6A1.

AIRFLOW SENSOR/BLOWER OFF Switch (Location A4)

Hold this switch in the OFF position when instructed by a maintenance procedure to test the operation of the airflow sensor. When in the OFF position, 50/60-Hz power is removed from the blower.

AIRFLOW SENSOR RELAY INDICATOR (Location A4)

When lit, indicates that the airflow high-temperature sensor switch has opened and subsequently has de-energized the relays supplying 400-Hz power.

Power-On UNIT A and B Switches (Power Control Panel)

Activate these switches to apply power in a sequentially stepped fashion to two separate chains of peripheral subsystem devices connected to the CCC. Power sequence circuits regulate the initial subsystem electrical load required by the attached peripherals during power-on.

19404-1/2/3/10/11/12 Logic Controls and Indicators

The following paragraphs describe logic controls and indicators common to the 19404-1/2/10/11 CCC and 19404-3/12 CCC option.

A04 Logic Module Switches and Indicators

A04 Logic module contains a master-clear pushbutton switch (SW2), light-emitting diode (LED) indicators 1 through 6, and microswitches SW1-1 through SW1-6. Their functions are described in the following paragraphs.

Master-Clear Pushbutton Switch (SW2)

This switch clears the coupler and starts execution of the internal diagnostics. An autoloading function or a diagnostic function initiated from the peripheral processor (PP) also causes execution of the internal diagnostics.

LED Indicators 1 Through 6

These LED indicators are designated 1 through 6, top to bottom respectively on the A04 logic module. They provide the following indications.

LED	Description
1	When lit, indicates a channel function parity error.
2	When briefly lit and then goes out, indicates the CYBER channel interface and processor interaction diagnostic has completed a successful check of the various interactions between this interface and the processor. This LED remains lit if the interaction diagnostic checks fail.
3	When lit, indicates a memory parity error detected by the CYBER channel interface.
4	When lit, indicates a deadman timeout.
5	When lit, indicates a processor parity error.
6	When briefly lit and then goes out, indicates the internal diagnostic has completed a successful check of the CYBER channel interface. This LED remains lit if the interface fails the check.

Switches SW1-1 Through SW1-8

These microswitches are used for the following functions. A switch in the OFF position indicates a set input (logical 1) to the coupler logic.

Switch	Description
SW1-1	Enables odd parity checking of all CYBER channel data and functions when placed in the OFF position. Disables parity checking when in the ON position.

Switch	Description								
SW1-2 through SW1-4	Defines the equipment types connected to the coupler. Present switch settings for existing equipment types are as follows (all other switch position combinations are undefined).								
	<table><tr><th>SW1-2</th><th>SW1-3</th><th>SW1-4</th><th>Peripheral Type</th></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>Tape (5680 CCTS)</td></tr></table>	SW1-2	SW1-3	SW1-4	Peripheral Type	ON	ON	OFF	Tape (5680 CCTS)
SW1-2	SW1-3	SW1-4	Peripheral Type						
ON	ON	OFF	Tape (5680 CCTS)						
SW1-5	Enables the coupler to loop on its internal diagnostic and never reach its idle routine when placed in the ON position. This is used for maintenance purposes only. Disables looping when switch is in the OFF position.								
SW1-6	Not used.								
SW1-7	Enables FIPS loopback diagnostics using test connectors on the FIPS channel when switch is in the ON position. Disables the diagnostics when switch is in the OFF position.								
SW1-8	Repeats FIPS loopback diagnostics when switch is in the ON position. Disables the diagnostics when switch is in the OFF position.								

A06 Logic Module Indicators

This module contains two LED indicators. The upper LED is lit while the processor is running. The lower LED is lit after a processor memory parity error occurs.

A07 Logic Module Indicator

This module contains one LED indicator. When the LED is lit and then goes out, it indicates that the processor diagnostic has completed a successful check of the processor. The LED will remain lit if the processor fails the diagnostic.

A11 Logic Module Indicators

This module contains two LED indicators. When the upper LED is lit and then goes out, it indicates that the FIPS device interface diagnostic has completed a successful check of the interface. The LED will remain lit if the interface fails the diagnostic.

When the lower LED is lit, it indicates that a memory parity error has been detected by the FIPS device interface.

A12 Logic Module Indicators

This module contains two LED indicators. When the upper LED is lit and then goes out, it indicates that the FIPS device interface diagnostic has completed a successful check of the interface. The LED will remain lit if the interface fails the diagnostic.

The lower LED is not used.

A14 Logic Module Switches and Indicators

The A14 logic module is the maintenance board. Refer to figure 2-3 for the location of the maintenance board switches and indicators and to the paragraphs that follow for a description of each.

DATA PARITY ERROR Indicator

When lit, this red LED indicates a parity error.

NORMAL MODE Indicator

When lit, this green LED indicates that the 19404-1/2/10/11 coupler or 19404-3/12 coupler option is selected in online mode when the option-A/normal/option-B switch is set to NORMAL.

OPTION-A Indicator

When lit, this yellow LED indicates that the 19404-1/2/10/11 was the last coupler that had written to the memory display when the option-A/normal/option-B switch is set to NORMAL.

OPTION-A, NORMAL, OPTION-B Switch

This switch selects the coupler from which memory locations are read and subsequently displayed on the 16 LED memory display (for offline maintenance purposes). If set to OPTION-A, the 19404-1/2/10/11 is selected and neither the NORMAL mode, OPTION-A, or OPTION-B LED is illuminated. Similarly, if set to OPTION-B, the 19404-2/12 is selected and neither the NORMAL mode, OPTION-A, or OPTION-B LED is illuminated. If set to NORMAL, the maintenance board functions as a memory-mapped display shared by both couplers and either the NORMAL mode, OPTION-A, or OPTION-B LED is illuminated. That is, either coupler can write to the 16 LED memory display; however, the 19404-1/2/10/11 coupler has priority over the 19404-3/12 coupler.

OPTION-B Indicator

When lit, this yellow LED indicates that the 19404-3/12 option was the last coupler that had written to the memory display when the option-A/normal/option-B switch is set to NORMAL.

Memory Display Indicators (Bits DB00 through DB15)

The memory display is a 16 LED display that shows the contents of the selected memory address in hexadecimal.

Address Select Thumbwheel Switches (Bits AD00 through AD15)

The four maintenance board thumbwheel switches specify which memory address is to be read from the selected coupler.¹ The memory address contents display in hexadecimal on the 16 LED memory display.

1. The OPTION-A/NORMAL/OPTION-B switch determines which coupler is selected.

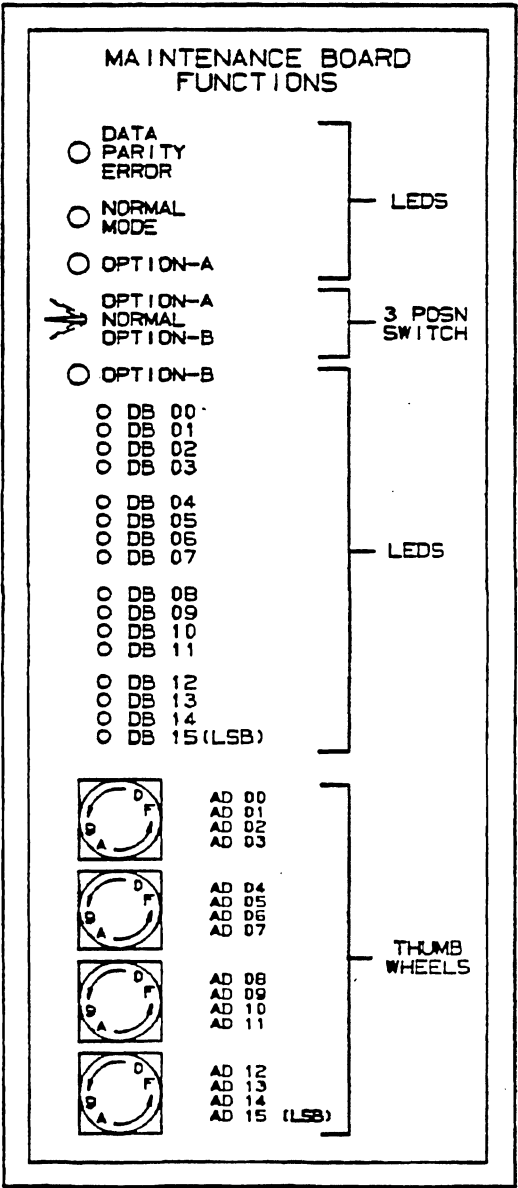


Figure 2-3. 19404-1/2/10/11 Maintenance Board Switches and Indicators

Operating Procedures

The following paragraphs provide general operating procedures applicable to the coupler.

19404-1/10 Power Application

Power application to the 19404-1/10 CCC is controlled by the 50/60-Hz and 400-Hz POWER DISCONNECT switches located in the power distribution panel on the front of the coupler. Power application to the attached peripherals is controlled by toggling ON and OFF the power-on UNIT A and power-on UNIT B switches, which are located on the coupler power control panel. During the installation of a peripheral subsystem, the customer engineer (CE) routes cables and sets switches according to requirements for power sequencing. Thereafter, the operator normally controls application of power to the subsystem from the coupler power control panel.

19404-2/11 Power Application

Power application to the 19404-2/11 CCC is controlled by the 50/60-Hz POWER DISCONNECT switch (CB1) located on the power distribution panel at the front of the coupler. Power application to the attached peripherals is controlled by toggling ON and OFF the power-on UNIT A and power-on UNIT B switches in the same manner as in a 19404-1/10 CCC.

19404-1/2/3/10/11/12 Microcode Autoloading

The appropriate microcode, which permits the coupler to control the attached peripheral subsystem, must be autoloaded into CCC random-access memory (RAM) before complete subsystem operation can occur. The following functions reside permanently within the coupler processor read-only memory (ROM) to enable autoloading of the microcode.

0414 _g	Autoload coupler microcode from PP
06uu _g	Autoload coupler microcode from disk

These functions are described in detail in the following paragraphs. The prescribed autoload procedure depends on the site operating procedures, the operating system being used, the computer system configuration, and whether or not the computer system is running. Refer to the appropriate operating system handbook for Control Data recommended procedures (for example, for NOS, refer to the NOS 2 Installation Handbook listed under Related Manuals in About This Manual).

Autoload Coupler Microcode from PP (0414_g)

This function initiates a microcode autoload from the PP to the coupler. During execution, the CYBER channel interface decodes the 0414_g function, lights four LEDs located on internal printed circuit (PC) boards, halts the coupler processor, and causes the Federal Information Processing Standard (FIPS) device interface to go to an idle loop. The following diagnostics are then executed:

- The CYBER device interface (DI) executes its universal-device-interface (UDI) diagnostic. If this diagnostic executes successfully, the CYBER channel interface turns off its LED (LED 6 on the A04 module) and starts the processor executing firmware microcode at programmable read-only memory (PROM) address 8000₁₆ (the first code to execute is an instruction test).

- If the instruction test is successful, the processor turns off its LED (on the A07 module) and executes a processor/CYBER channel interface interaction test.
- If the processor/CYBER channel interface interaction test executes without error, a third LED is turned off (LED 2 on the A04 module) and the processor instructs the FIPS device interface to execute its UDI diagnostic.
- If the UDI diagnostic test is successful, the FIPS device interface turns off its LED (upper LED on the A12 module).

If all the preceding diagnostics execute without error, a reply is generated for the autoloading function. The lower eight bits of each consecutive 12-bit microcode word are then transferred from PP memory to alternate upper and lower 8-bit byte positions in coupler RAM beginning at location 0030₁₆. This method uses two 12-bit PP memory words to load each 16-bit coupler RAM word. The coupler remains in autoloading mode until the PP disconnects the channel. A partial autoloading of four words or less can be performed to recover from channel timeout errors. Program execution is returned to the idle loop following a partial autoloading.

During full autoloading, the coupler firmware does a memory test after the eighth word is received from the channel. If the test is successful, the firmware completes the autoloading. After the PP disconnects the channel, the coupler firmware calculates a checksum from the microcode data loaded into the coupler RAM. If there is a memory test error or a checksum error, the coupler processor stops and the channel is deactivated by the deadman timer. If there are no errors, the coupler processor and FIPS interface interaction tests are executed.

These tests are part of the downloaded microcode. If the interaction tests fail, either the equipment switches are set wrong, the microcode number in binary is wrong, or general status is set to 5xxx, where xxx is an octal error code. Refer to the appropriate peripheral subsystem user's guide for a listing of applicable error codes. If there are no errors, a release is issued to all devices connected to the coupler, the general status is set to zero, and the coupler processor goes to an idle loop to wait for additional functions from the PP.

Autoloading Coupler Microcode from Device (06uu₈)

The autoloading coupler microcode from device function (06uu₈) causes the coupler to execute the same diagnostics as in a full autoloading microcode from PP function (0414₈). If the diagnostics execute without error, the processor firmware checks the coupler hardware switches to determine which device to load from.

After the coupler RAM is loaded with microcode data, the coupler firmware calculates a checksum and compares it with the correct value. If it doesn't compare, then either a function parity error has occurred, the microcode number is wrong, or the coupler couldn't load from the device. For these cases, an autoloading function reply is not returned to the PP. If the coupler RAM is successfully loaded, an autoloading function reply is returned to the PP, the device is released, and a jump is made to the coupler ROM idle loop.

Installation and Checkout

3

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This chapter provides information necessary to install and checkout the CYBER Channel Coupler (CCC). Information within this chapter is presented under the following major headings.

- Site Preparation Information
- Crating/Uncrating
- Installation Procedure
- Initial Start-Up Procedure
- CYBER Channel Clock-Tuning Verification Procedure
- Coupler Option Installation Procedure

Site Preparation Information

Site planning information for a 19404-1/2/10/11 CCC is in the Computer Systems Site Preparation Peripheral Data manual listed under Related Manuals in About This Manual.

Crating/Uncrating

Refer to procedure 8:504:00 in the Customer Engineering Operating Manual when necessary to crate the coupler for shipment. This procedure provides the latest information on obtaining packaging materials and instructions for crating. No special procedures are required when uncrating the coupler.

Installation Procedure

The following paragraphs provide information on space considerations, input-power and signal-cable connections and hardware unique identifier (HUI) wiring to be used when installing the coupler.

Space Consideration

The location of the coupler must allow enough room to open the front and rear doors to their maximum position for operating and maintenance purposes. Refer to the Computer Systems Site Preparation Peripheral Data manual, listed under Related Manuals in About This Manual, for a floor plan layout of the coupler.

19404-1/10 Input Power Connections

Refer to figure 3-1 and perform the following steps to connect input ac power cables to the 19404-1/10 CCC.

- 1. Verify that site ac input power circuit breakers feeding coupler are in OFF position. Also check that 400-Hz and 50/60-Hz POWER DISCONNECT switches on A7 power distribution box of coupler are in OFF position.
- 2. Remove six mounting screws and lockwashers from rear cover of A7 power distribution box and remove cover.
- 3. Connect 1-phase power cable to A7 power-distribution-box terminals as indicated if applicable. (Customer is responsible for providing power cables.)

- a. Connect 120-V, 50/60-Hz power cable to the A7 terminal as follows.

120-V, 50-Hz Power Cable	120-V, 60-Hz Power Cable	A7 Terminal
Line 2 or Neutral	Line 2	TB4-1
Line 1	Line 1	TB4-2
Safety ground	Safety ground	E12

- b. Connect the 230-V, 50-Hz or 240-V, 60-Hz power cable to the A7 terminal as follows.

230-V, 50-Hz Power Cable	240-V, 60-Hz Power Cable	A7 Terminal
Line 2 or Neutral	Line 2	TB4-3
Line 1	Line 1	TB4-4
Safety ground	Safety ground	E12

- 4. For 220- through 250-V units only, connect wire from A7S1-8 to appropriate 220-, 230-, 240-, or 250-V terminal of A7T1.
- 5. Connect 120/208-V, 400-Hz, 3-phase power cable to A7 power distribution box terminals as follows.

120/208-V, 400-Hz Power Cable	A7 Terminal
Neutral	TB5-1
Line 1	TB5-2
Line 2	TB5-3
Line 3	TB5-4
Safety ground	E13

- 6. Replace rear cover on power distribution box.
- 7. Connect plug ends of power cables to appropriate site power outlets.

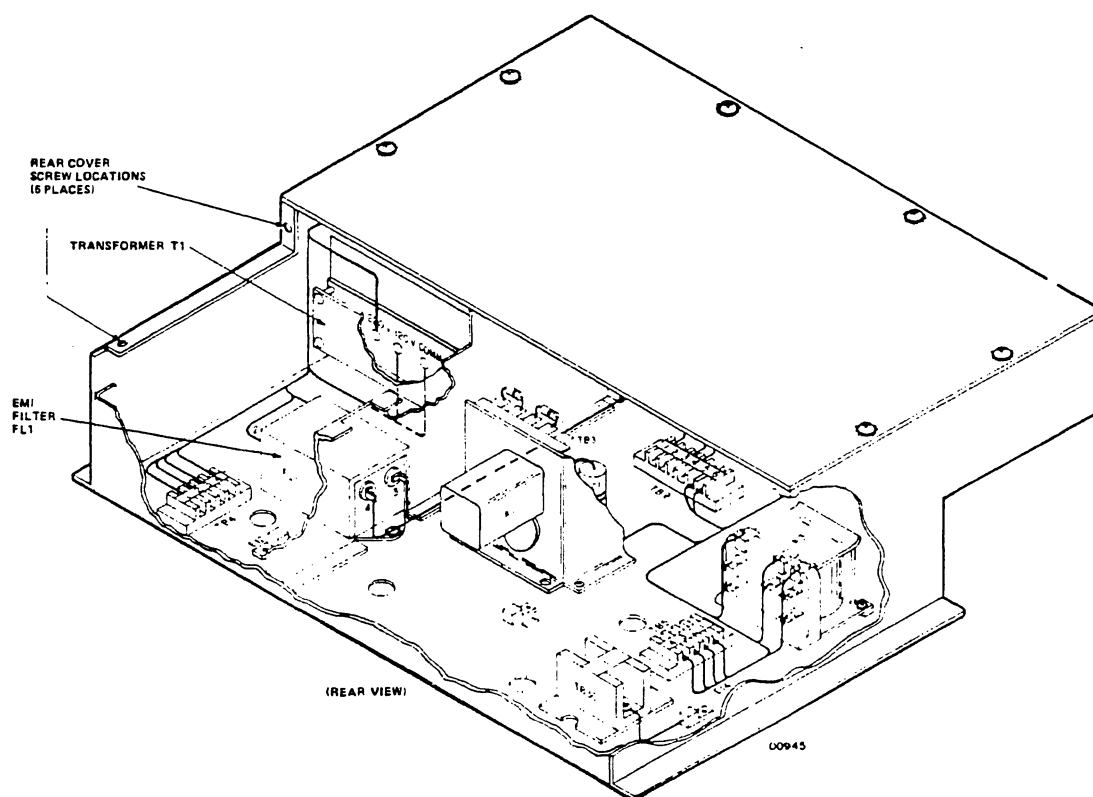


Figure 3-1. 19404-1/10 Power Distribution Box Components Assembly A7

19404-2/11 50-Hz Input Power Connections

Each 19404-2/11 CCC leaves the factory with a preinstalled 60-Hz input power cable. However, for a 19404-2/11 CCC that will be installed at a 50-Hz site, perform the following steps to modify the input wiring for 50 Hz. (Refer to figure 3-2.)

- ___ 1. Turn 50/60-Hz switch/circuit breaker (CB1) OFF and disable site, wall-mounted circuit breaker feeding CCC.
- ___ 2. Remove power distribution box cover directly above TB1.
- ___ 3. Disconnect source wires from TB1-1, TB1-2, and E1.
- ___ 4. Dislodge knockout from floor of power distribution box.¹
- ___ 5. Insert wires from site power wiring up through knockout, into power distribution box.
- ___ 6. Connect 1-phase, 50-Hz power cable as follows.

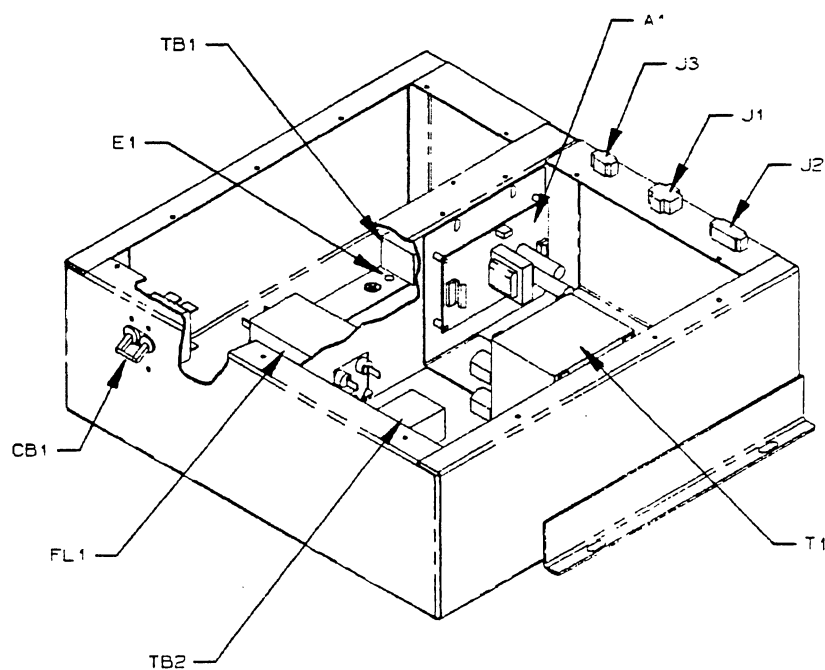
230-V, 50-Hz Power Cable

A7 Terminal

Line 2 or Neutral	TB1-2
Line 1	TB1-1
Safety ground	E1

- ___ 7. Replace the power distribution box covers removed in procedure 1.

1. The knockout is located to the left of TB1 when viewed from the rear of the CCC cabinet.



19404-C5

Figure 3-2. 19404-2/11 Power-Distribution-Box Components A7 Assembly

19404-1/2/10/11 I/O and EPO Cable Installation

Figure 3-3 shows the location of the coupler I/O and EPO cable connectors on a 19404-1/2/10/11 CCC.

Table 3-1 lists CDC part numbers (P/Ns) for various lengths of acceptable shielded cables.

Table 3-1. Cable Lengths and CDC Part Numbers

Length (ft/m)	I/O Cable P/N	EPO Cable P/N
40/12.2	22143240	72940807
60/18.3	22143241	72920811
80/24/4	22143242	72920815
100/30.5	22143243	72920819
150/45.7	22143244	72920824
200/61.0	22143245	72920829
300/91.4	22143246	72920830
400/121/9	22143247	72920831

Perform the following steps to install I/O and EPO cables.

1. Connect two I/O cables (CDC P/N 19191600) between coupler INPUT and OUTPUT connectors and PP.
2. Connect two I/O cables (CDC 2214324x) between coupler CHANNEL A BUS and TAG connectors and external FIPS interface peripheral device. (Connect dark gray connectors to CCC and light gray connectors to external FIPS device.) Be sure to connect quick-disconnect terminals from cable shields to spade lugs mounted next to I/O connectors.
3. Install two terminator assemblies: CDC P/N 75268900 at BUS connector, and CDC P/N 94390700 at TAG connector of last external FIPS device.
4. Connect EPO cable (CDC P/N 729208xx) between UNIT A connector of coupler and EPO connector of external FIPS device.

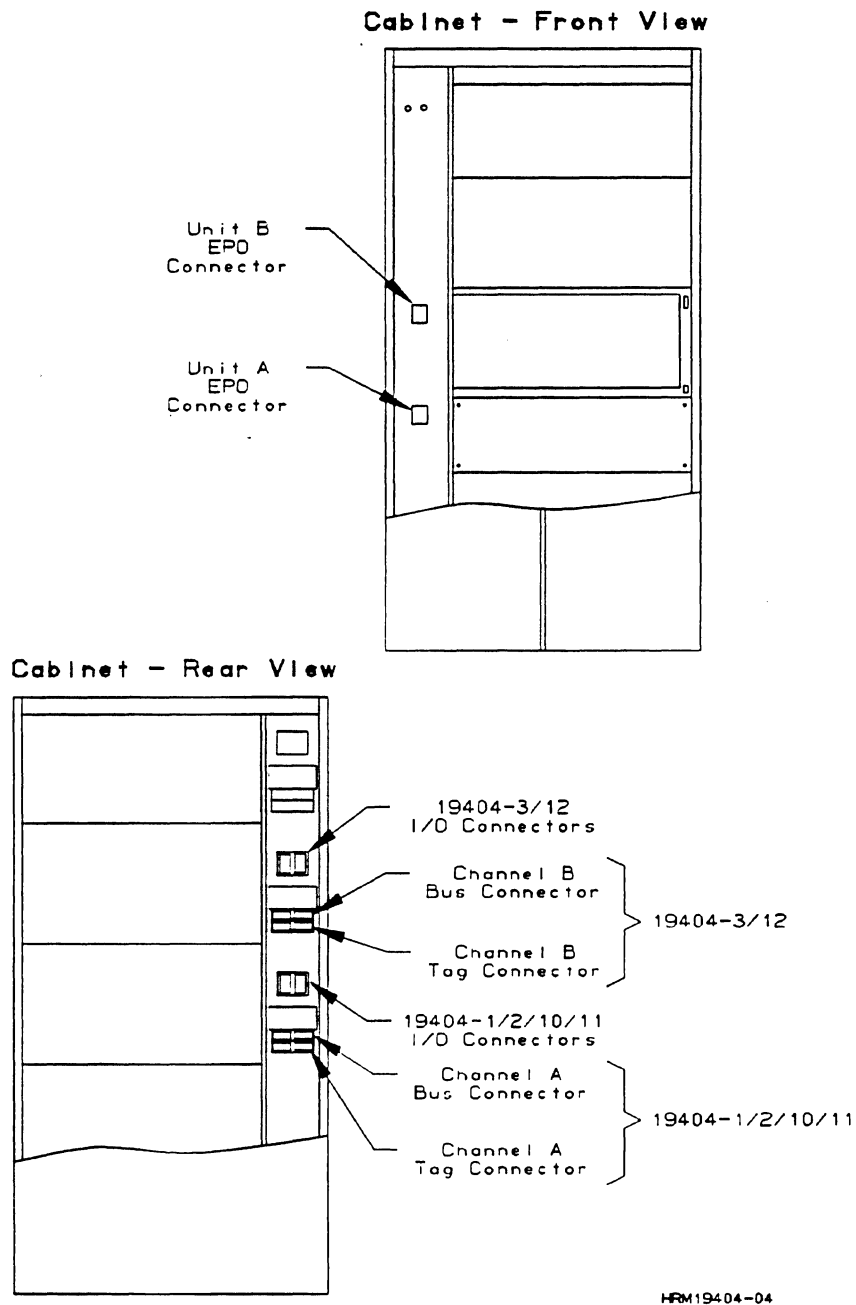


Figure 3-3. 19404-1/2/10/11 Coupler I/O and EPO Cable Connectors

To present the information in this chapter in a structured format, this page has been left blank.

Hardware Unique Identifier Wiring

The hardware performance analyzer (HPA) requires that each coupler have a HUI. The HUI consists of eight bits that form two hexadecimal characters. The site manager must select the hexadecimal code, being certain that each number selected is unique at the site.

Hardwire the HUI on the CCC as follows.

- ___ 1. Select HUI number.
- ___ 2. Locate following pins on coupler backpanel at A04 chassis location.

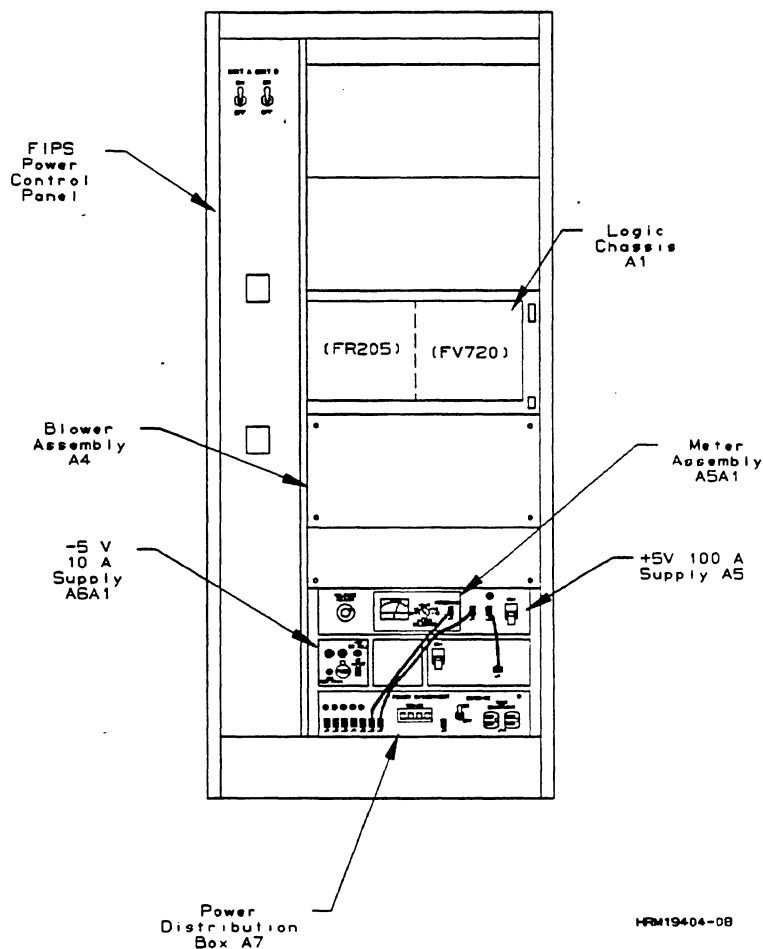
Pin	Bit Position
P1B21	2 ⁷
P1A20	2 ⁶
P1B19	2 ⁵
P1A18	2 ⁴
P1A21	2 ³
P1B26	2 ²
P1A19	2 ¹
P1B18	2 ⁰

- ___ 3. Remove any wires attached to these pins.
- ___ 4. Ground pins, as necessary, by attaching a wire to selected pin and a pin on row C or D of backpanel. Grounded pin is equivalent of logical 1; open pin is a zero. For example, to assign an HUI of 17₁₆, ground pins P1A18, P1B26, P1A19, and P1B18.

Initial Start-Up Procedure (19404-1/2/10/11)

Perform the following steps to start up a CCC immediately following installation. Refer to figure 3-4 for switch location and voltage adjust controls.

1. Perform the following steps if starting up a 19404-1 or 19404-10 CCC.
 - a. Turn voltage adjust control on the +5-V power supply and -5-V dc adjustment control on -5-V power supply fully counterclockwise.
 - b. Turn 50/60-Hz POWER DISCONNECT switch ON; blower should run.
 - c. Turn 400-Hz POWER DISCONNECT switch/circuit breaker ON; the POWER ON indicator (upper-left corner of cabinet front) should light.
 - d. Set METER SELECTOR switch on +5-V power supply to +5 position. Turn VOLTAGE ADJUST control until percent meter indicates 0 percent.
 - e. Set METER SELECTOR switch to -5 position. Turn -5V DC ADJ control until percent meter indicates 0 percent.



HMM19404-08

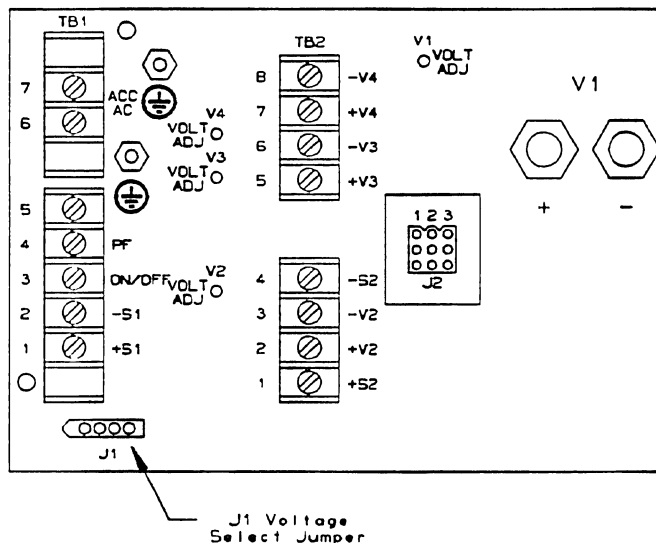
Figure 3-4. Switch and Voltage Adjust Controls (19404-1/10)

- ___ 2. Perform the following steps if starting up a 19404-2 or 19404-11 CCC.
 - ___ a. Open rear panel of 19404-2/11 CCC and locate the power supply (figure 3-5).

⚠ WARNING

Failure to configure J1 on the 19404-2/11 power supply for 230 V operation may result in damage to the CCC and introduce a safety hazard.

- ___ b. Ensure that voltage select jumper J1 is set for 230-V operation (the 230-V plug has a jumper between pins 2 and 3 as opposed to the 115-V plug, which has a jumper between pins 1 and 2 and pins 3 and 4).



HFM19404-13

Figure 3-5. Power Supply, Rear View (19404-2/11)

- ___ c. Turn 50/60-Hz POWER DISCONNECT switch/circuit breaker ON.
- ___ d. Blower should operate and POWER ON indicator (extreme upper-left corner of cabinet front) should light.
- ___ 3. Place OPTION-A/NORMAL/OPTION-B switch on the maintenance board to NORMAL.
- ___ 4. Press master clear pushbutton on A04 logic module. The coupler executes its internal diagnostic and displays test results on 16 LED memory display (located on maintenance board).

NOTE

A hexadecimal code indicating successful test completion or a test error is displayed in the 16 LED memory display. Code 8800₁₆ indicates successful test completion. Observe LED indicators on A04, A07, and A12 logic modules to verify successful test operation. Refer to chapter 2 for LED indicator descriptions and chapter 6 for internal diagnostic test descriptions. Refer to SAM 3 in chapter 7 to troubleshoot any internal diagnostic errors.

- 5. Run coupler downline diagnostic tests from peripheral processor (PP). Refer to chapter 6 for a description of downline diagnostic tests and information on how to execute them using either MALET or DEMOT. Refer to the appropriate SAM in chapter 7 to troubleshoot any downline diagnostic errors.
- 6. Load applicable peripheral subsystem microcode into CCC RAM. Refer to chapter 2 for autoloading information.

CYBER Channel Clock-Tuning Verification Procedure

Clock tuning is performed at the factory prior to shipment and should not be performed in the field. This procedure is provided only to verify that the tuning is correct. If a clock-tuning problem exists, return the module to the factory for replacement. This verification procedure applies to both the A01 module contained in the 19404-1/2/10/11 CCC and the A15 module contained in the 19404-3/12 CCC option.

- ___ 1. Turn either 400-Hz POWER DISCONNECT switch/circuit breaker (19404-1/10) or 50/60-Hz POWER DISCONNECT switch/circuit breaker (19404-2/11) OFF.
- ___ 2. Connect CYBER channel I/O cables if not already installed.
- ___ 3. Place A01 logic module of 19404-1/2/10/11 CCC (or A15 of 19404-3/12 CCC option) coupler on card extender.
- ___ 4. Turn either 400-Hz POWER DISCONNECT switch/circuit breaker (19404-1/10) or 50/60-Hz POWER DISCONNECT switch/circuit breaker (19404-2/11) ON.
- ___ 5. Use following steps to verify accuracy of 10-MHz clock, oscilloscope, and probes.
 - ___ a. Synchronize TP34 using channel A of oscilloscope. There should be 100 ± 2 ns from leading edge of one pulse to leading edge of next pulse.
 - ___ b. Compare channel B with channel A; they should be same.
- ___ 6. Check 40-MHz clock circuit as follows.
 - ___ a. Ground TP34 or 4017-13.
 - ___ b. Synchronize TP36; leading edge of pulses should be 90 ± 2 ns apart.
 - ___ c. Remove ground installed in step 6a.
 - ___ d. Pulses at TP36 should be 100 ± 2 ns apart.
- ___ 7. Check T75D pulse relationship with T75 pulse as follows.
 - ___ a. Synchronize TP36 (T75) using channel A of oscilloscope.
 - ___ b. Connect channel B to TP30 (T75D); leading edge of pulse at TP30 should lag leading edge of pulse at TP36 by 15 ± 2 ns.
- ___ 8. Turn either 400-Hz POWER DISCONNECT switch/circuit breaker (19404-1/10) or 50/60-Hz POWER DISCONNECT switch/circuit breaker (19404-2/11) OFF and replace logic module in chassis.
- ___ 9. Turn either 400-Hz POWER DISCONNECT switch/circuit breaker (19404-1/10) or 50/60-Hz POWER DISCONNECT switch/circuit breaker (19404-2/11) ON and reload peripheral subsystem microcode into coupler. Refer to chapter 2 for autoloading information if needed.

Coupler Option Installation Procedure

Perform the following steps to install the 19404-3/12 coupler option.

- ___ 1. Turn either 400-Hz POWER DISCONNECT switch/circuit breaker (19404-1/10 CCC) or 50/60-Hz POWER DISCONNECT switch (19404-2/11 CCC) OFF.
- ___ 2. Refer to chassis map in chapter 5 for correct card placement, and install logic modules in logic chassis.
- ___ 3. Connect two I/O cables (CDC P/N 19191600) between the 19404-3/12 CCC input and output connectors and the PP. Refer to figure 3-2 for coupler I/O connector locations.
- ___ 4. Connect two I/O cables (CDC P/N 774750xx) between 19404-3/12 CCC channel B bus and tag connectors (figure 3-3) and external FIPS device. Be sure to connect quick-disconnect terminals from cable shields to spade lugs mounted next to I/O connectors.
- ___ 5. Connect EPO cable (CDC P/N 729208xx) between UNIT B connector of coupler (figure 3-2) and EPO connector of external FIPS device.
- ___ 6. Install two terminator assemblies: CDC P/N 75268900 at BUS connector and CDC P/N 94390700 at TAG connector of last FIPS device.
- ___ 7. Attach 19404-3/12 ID tag to front panel of coupler just to right of 19404-1/2/10/11 ID tag.
- ___ 8. Attach 19404-3/12 FCO log to inside of rear cabinet door next to 19404-1/2/10/11 FCO log.
- ___ 9. Assign 8-bit HUI to the 19404-12 coupler by wiring the appropriate backpanel pins at A18 chassis location. Refer to Hardware Unique Identifier Wiring described previously in this chapter.
- ___ 10. Turn either 400-Hz POWER DISCONNECT switch/circuit breaker (19404-1/10) or 50/60-Hz POWER DISCONNECT switch/circuit breaker (19404-2/11) ON.
- ___ 11. Place OPTION-A/NORMAL/OPTION-B switch on maintenance board to NORMAL.
- ___ 12. Press master clear pushbutton on A18 logic module of the 19404-3/12 coupler. Coupler executes its internal diagnostic and displays test results on 16 LED memory display (located on maintenance board).

NOTE

A hexadecimal code indicating successful test completion or a test error is displayed in the 16 LED memory display. Code 8800₁₆ indicates successful test completion. Observe LED indicators on A04, A07, and A12 logic modules to verify successful test operation. Refer to chapter 2 for LED indicator descriptions and chapter 6 for internal diagnostic test descriptions. Refer to SAM 3 in chapter 7 to troubleshoot any internal diagnostic errors.

- ___ 13. Run coupler downline diagnostic tests from PP. Refer to chapter 6 for description of downline diagnostic tests and information on how to execute them using either MALET or DEMOT. Refer to appropriate SAM in chapter 7 to troubleshoot any downline diagnostic errors.
- ___ 14. Load applicable subsystem operating microcode into coupler RAM. Refer to chapter 2 for autoload information.

Refer to the following manuals for information on CYBER Channel Coupler (the coupler) theory of operation.

- Logic Circuit Descriptions – text pages in the diagrams chapter of this manual.
- Subsystem Microcode Functional Description – applicable subsystem user's guide as listed under Related Manuals in About This Manual.
- Coupler Microcode Functional Description – CYBER Channel Coupler 19404-1/2/3/10/11/12 Hardware Reference Manual listed under Related Manuals in About This Manual.

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This chapter contains a chassis map, block diagrams, logic diagrams, an interface diagram for the CYBER channel coupler (CCC), maintenance diagrams, and power distribution diagrams.

The diagrams for the optional coupler (19404-3 or 19404-12) are the same as those for the basic coupler (19404-1, 19404-2, 19404-10, or 19404-11) diagrams except for the location of the logic boards. The basic coupler logic is contained in locations 01 through 14 of logic row A; and the optional coupler is contained in locations 15 through 27 of logic row A. Refer to the chassis map for specific card locations.

Refer also to the TTL Key to Logic Symbols Customer Engineering Manual, listed under Related Manuals in About This Manual, for a description of the symbology used in the logic diagrams. Conventions used to annotate the logic diagrams are shown in figure 5-1.

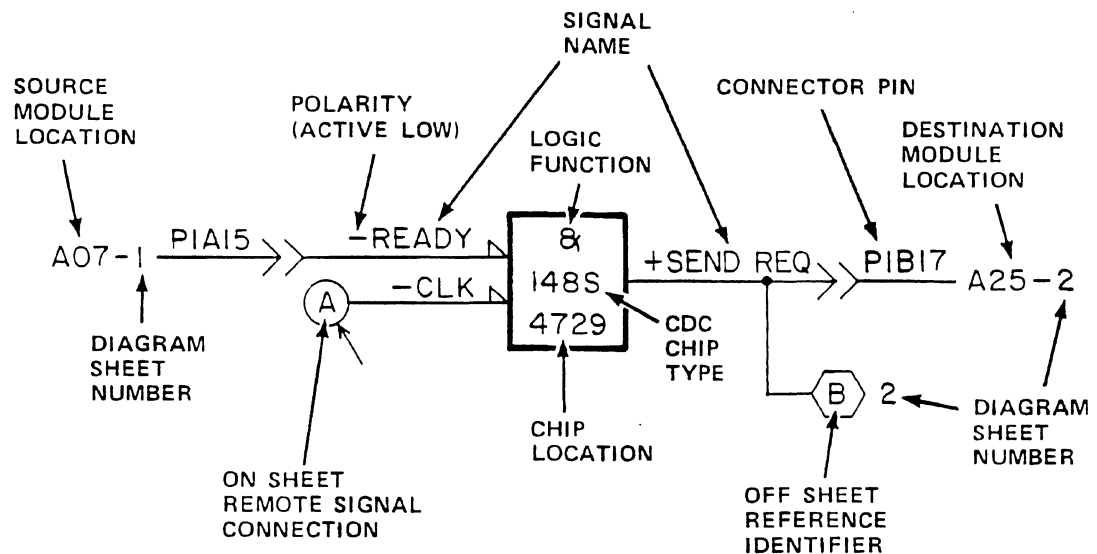


Figure 5-1. Logic Diagram Conventions

CCC Chassis MAP

The general data paths for the coupler are shown in the diagrams following the chassis map. These include:

- CYBER interface read/write block diagrams
- FIPS interface read/write/transfer block diagrams
- Processor and memory block diagrams

14	Maintenance 10285797
13	FIPS Interface - IV 10283690
12	FIPS Interface - III 53590866
11	FIPS Interface - II 10283554
10	Stream Logic 12107787
09	FIPS Interface - UDI 10304457
08	Transfer Logic 10283570
07	Memory 10283566
06	Processor Control 10292489
05	Processor ALU 53595819
04	CYBER Interface - Status/Clocks 22137381
03	CYBER Interface - UDI 12107866
02	CYBER Interface - Data Bus 12168320
01	CYBER Interface - Channel 12107874

19404-1/2/10/11 Standard Coupler

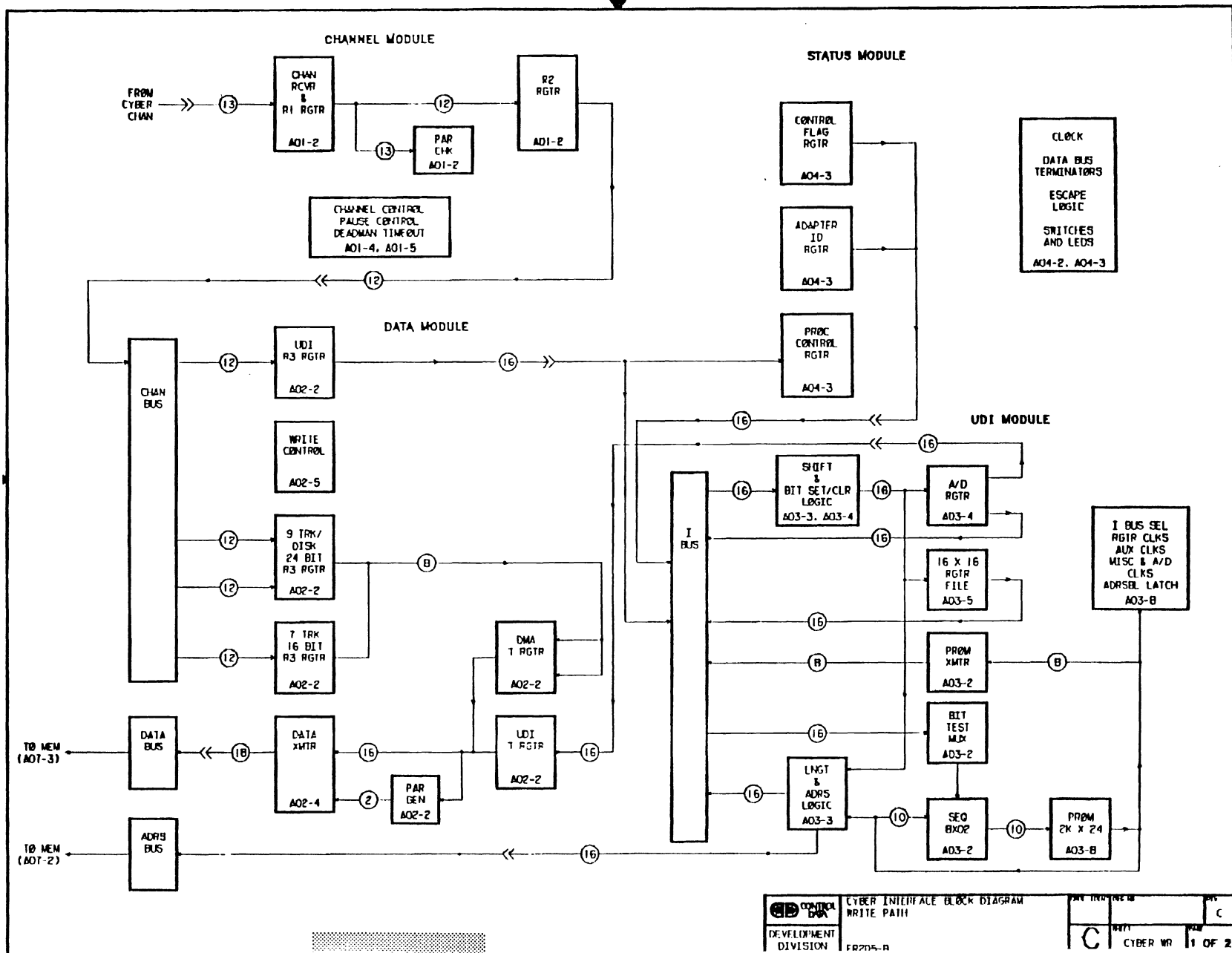
27	FIPS Interface - IV 10283690
26	FIPS Interface - III 53590866
25	FIPS Interface - II 10283554
24	Stream Logic 12107787
23	FIPS Interface - UDI 10304457
22	Transfer Logic 10283570
21	Memory 10283566
20	Processor Control 10292489
19	Processor ALU 53595819
18	CYBER Interface - Status/Clocks 22137381
17	CYBER Interface - UDI 12107866
16	CYBER Interface - Data Bus 12168320
15	CYBER Interface - Channel 12107874

19404-3/12 Optional Coupler

M04428

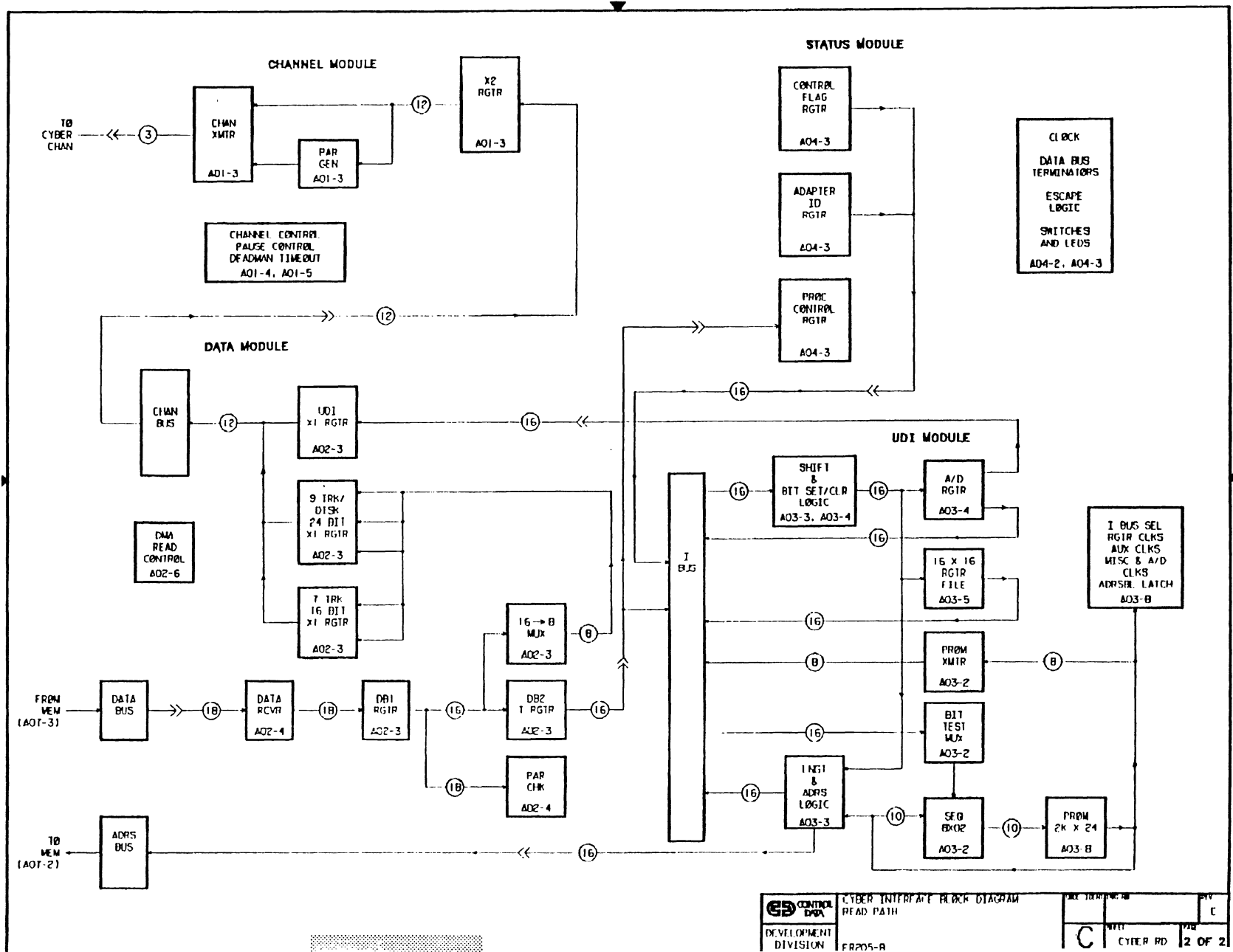
CYBER Interface Block Diagram Write Path

The CYBER interface block diagram for the write path is shown on the following page.



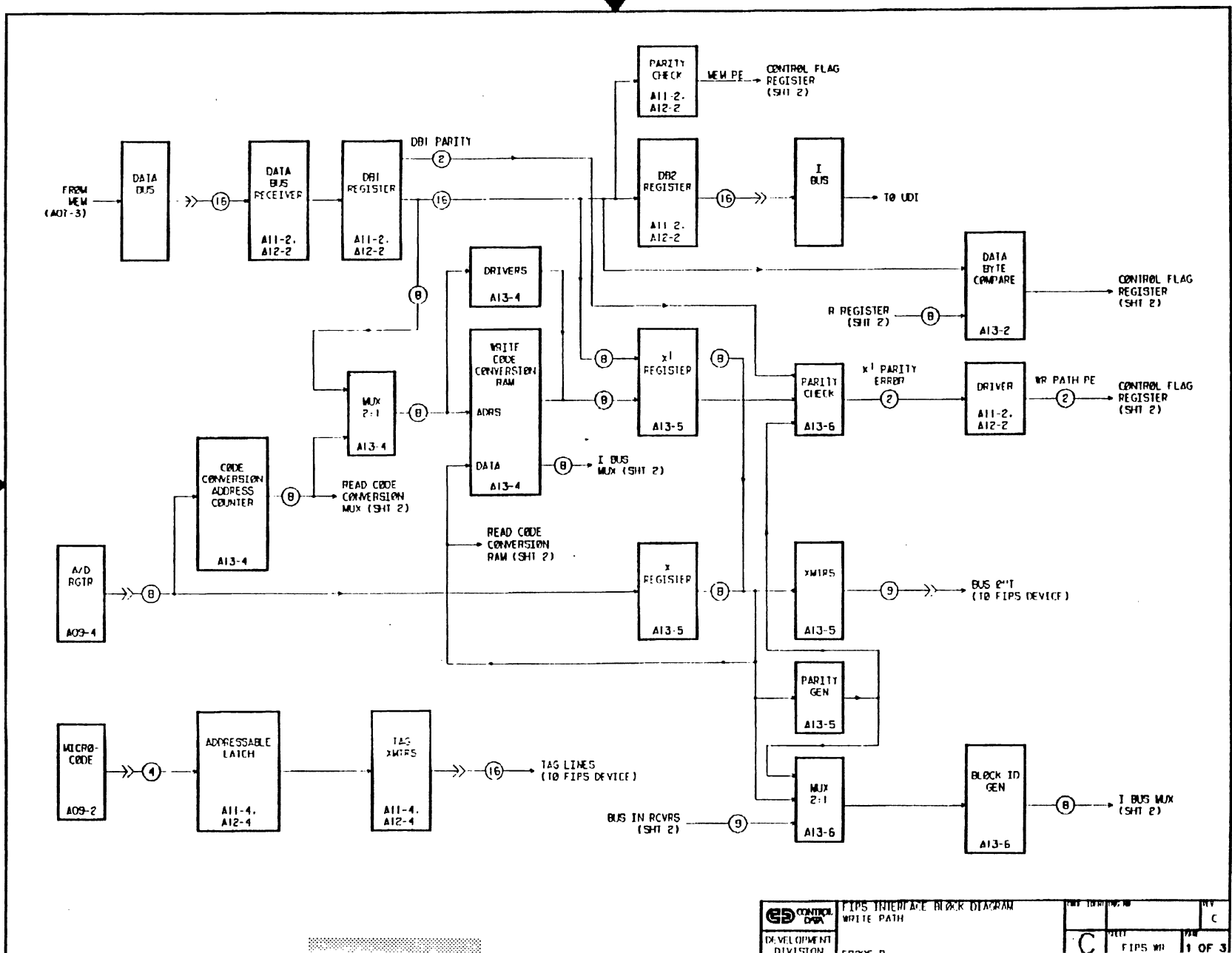
CYBER Interface Block Diagram Read Path

The CYBER interface block diagram read path is shown on the following page.



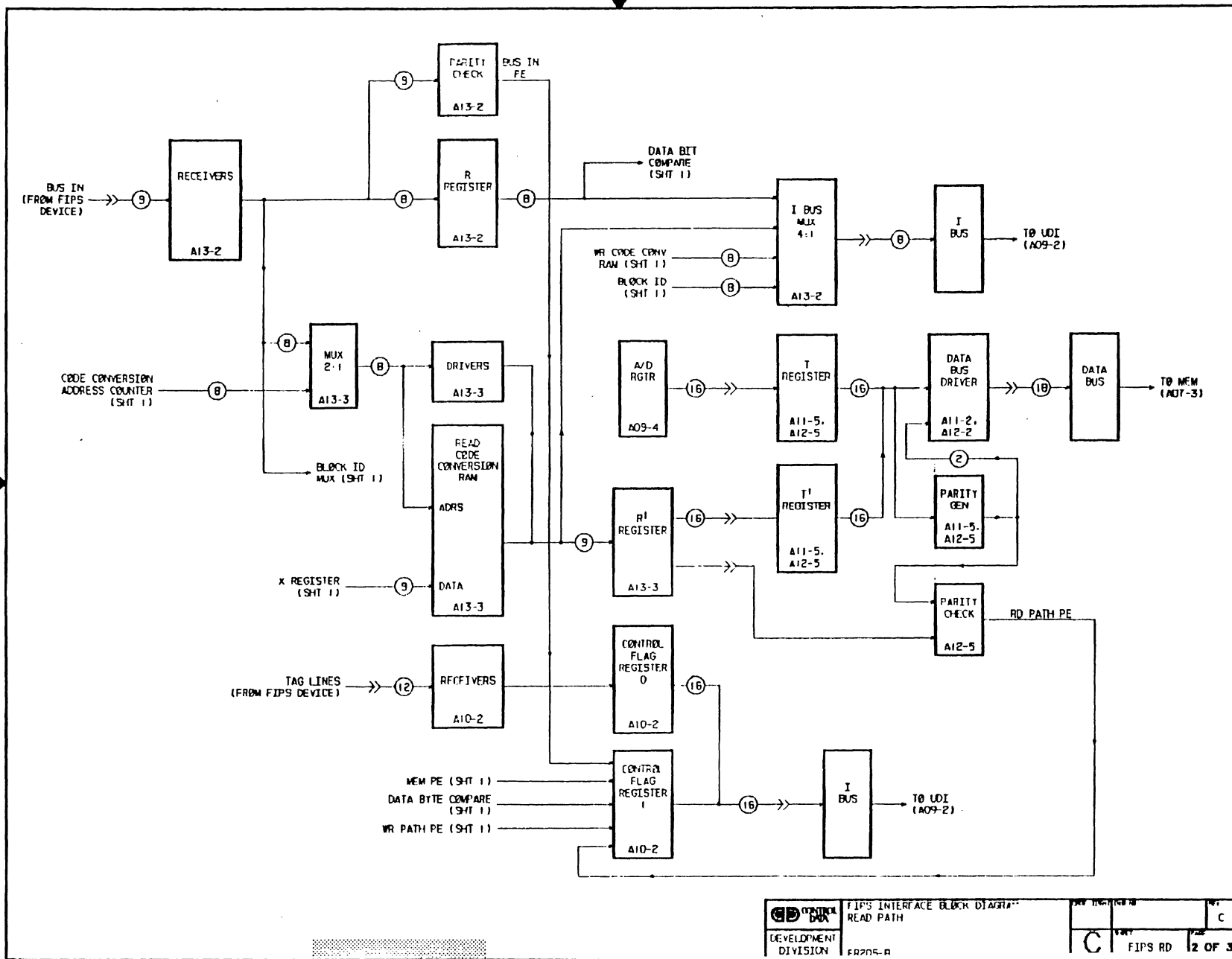
FIPS Interface Block Diagram Write Path

The FIPS interface block diagram write path is shown on the following page.



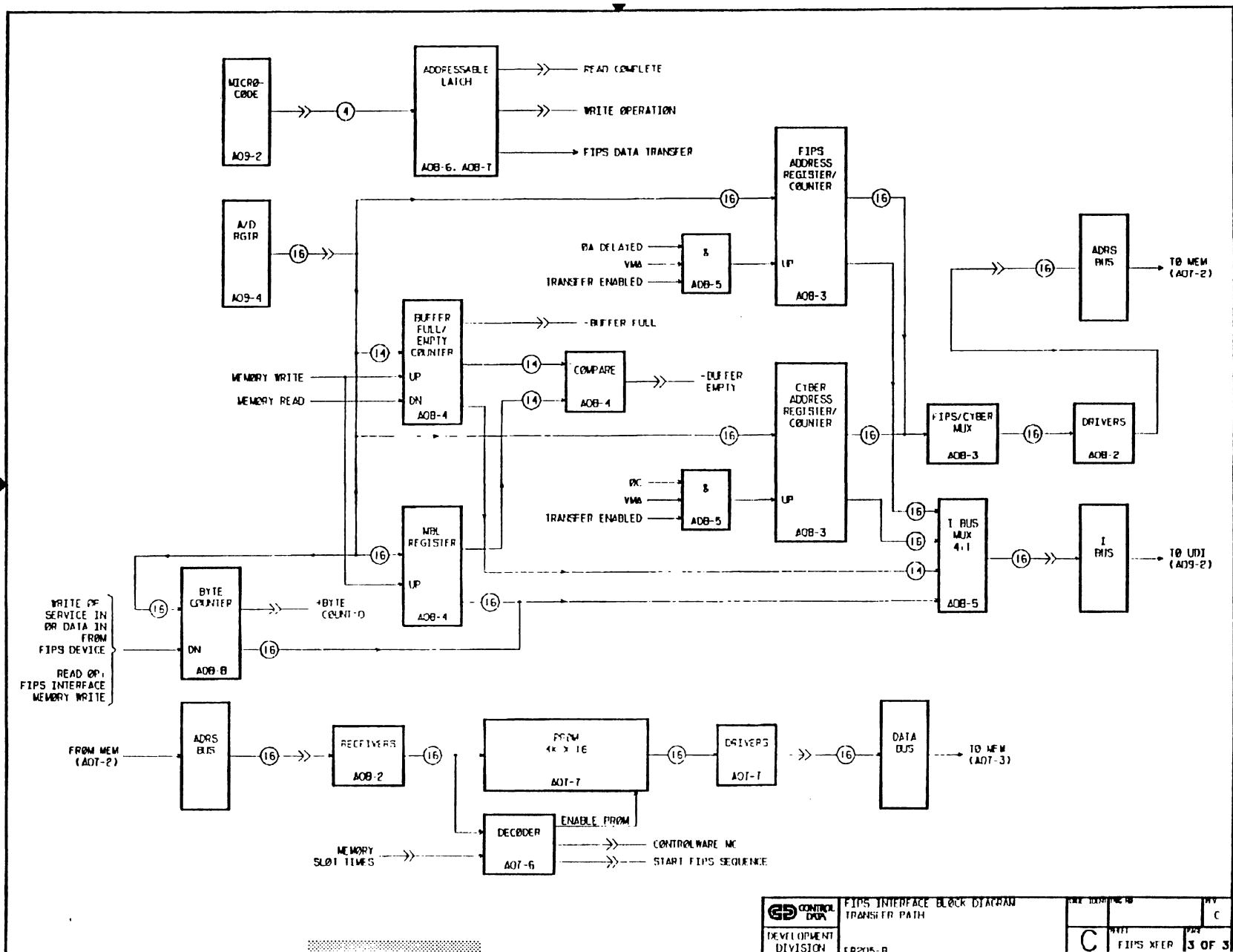
FIPS Interface Block Diagram Read Path

The FIPS interface block diagram read path is shown on the following page.



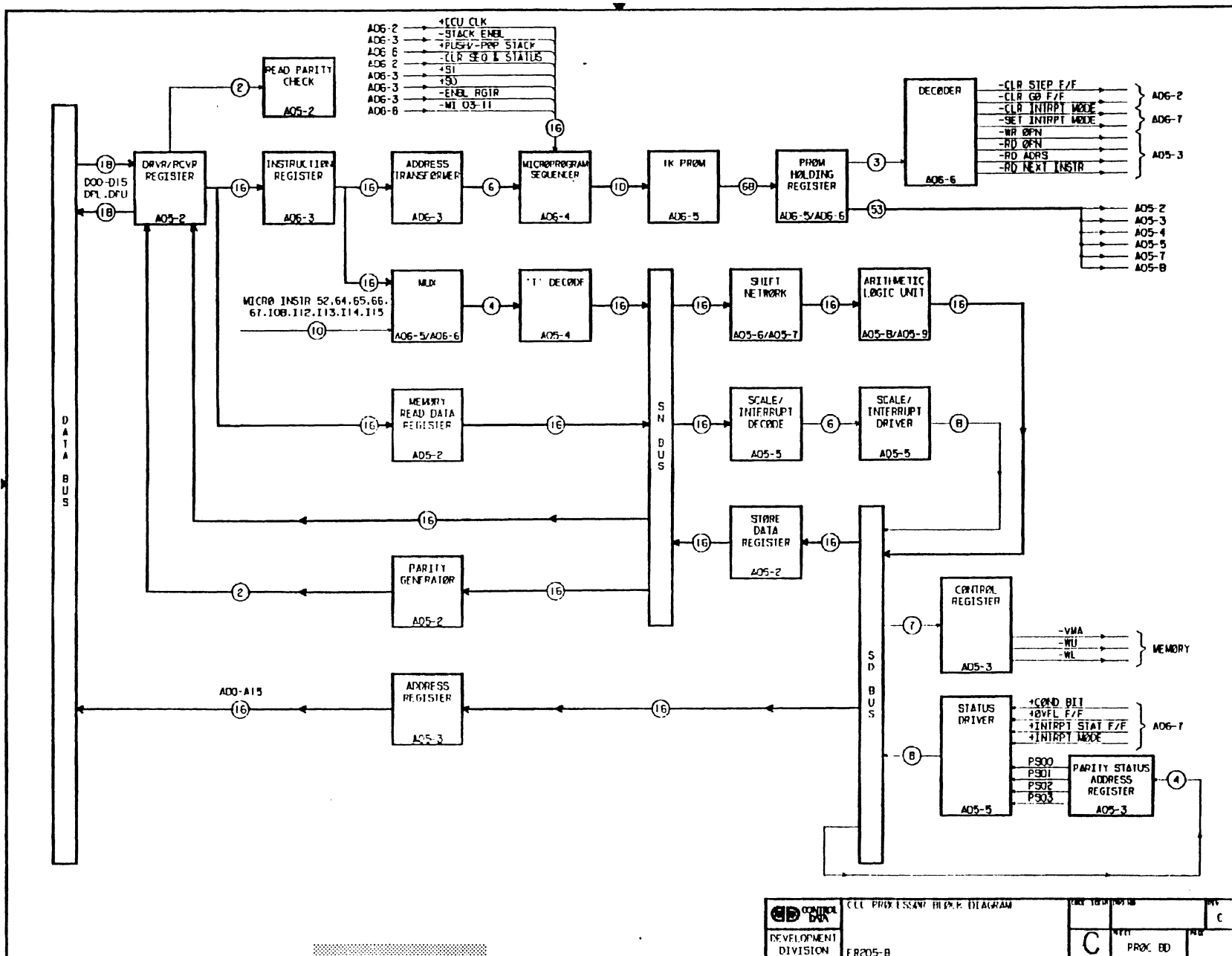
FIPS Interface Block Diagram Transfer Path

The FIPS interface block diagram transfer path is shown on the following page.



CCC Processor Block Diagram

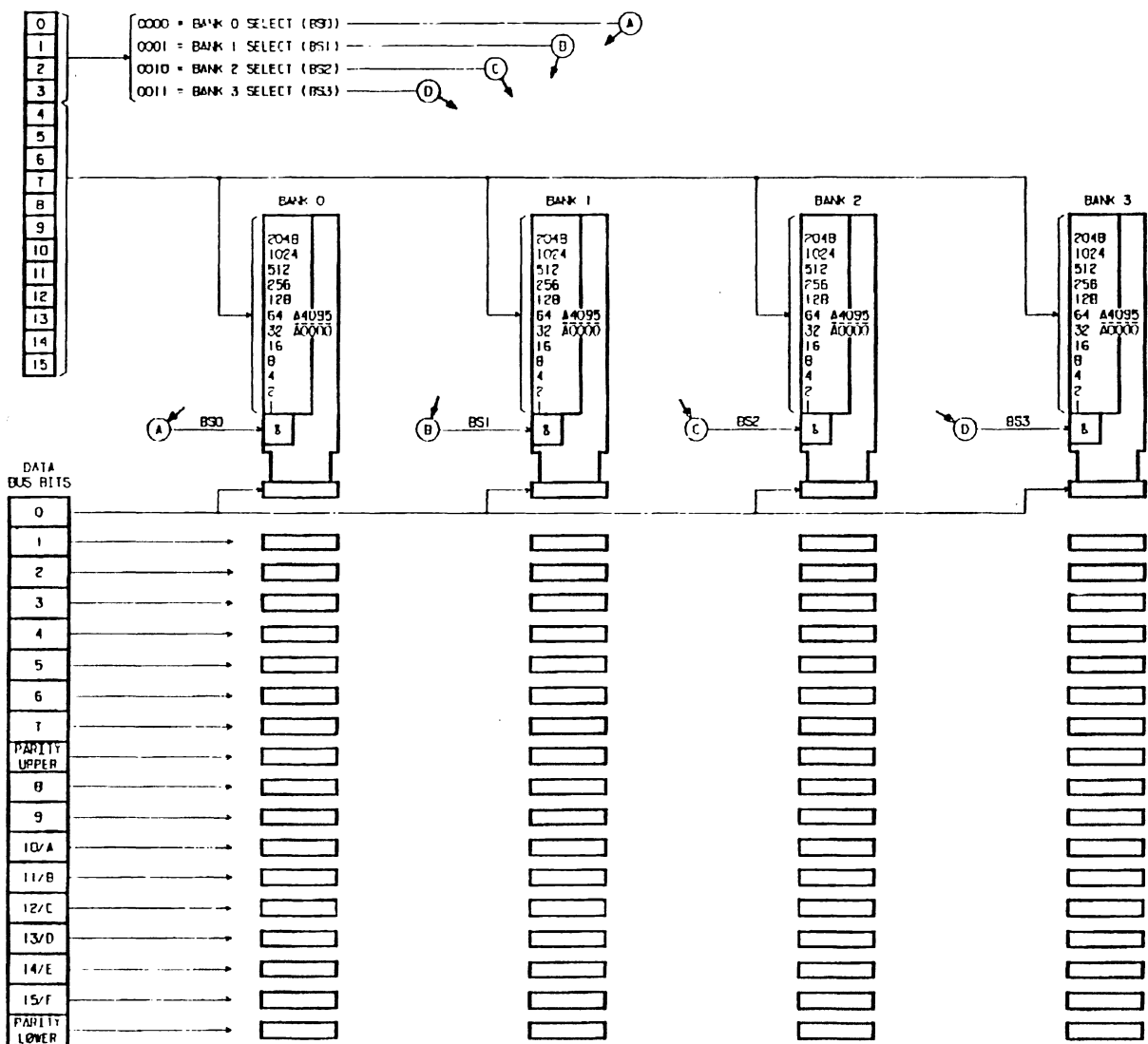
The CCC processor block diagram is shown on the following page.



CCC Processor Block Diagram

CCC Memory Block Diagram


The CCC memory block diagram is shown on the following page.



	CCC MEMORY BLOCK DIAGRAM	REV. 10/19/80	MC
	DEVELOPMENT DIVISION	FR275-R	C
		MEM. BD	

CYBER Channel Interface Logic Diagram (A01)

The revision level for each sheet of the logic diagrams for the CYBER Channel I/F are listed on the logic diagram cover sheet (the following page).

OWN	D. WITZKE	4/9/80	 CONTROL DATA CORPORATION ARDEN HILLS OPERATIONS ST. PAUL, MINN.
CHRD	D. WITZKE	4/9/80	
ENGR	D. WITZKE	4/9/80	
WFG	T. SPIEDL		
APYD	D. WITZKE	4/9/80	
EQUIP NO. 19404-10			TITLE CYBER-IF FILE # 34010 DWE NO. 10283761 SHEET TITLE-1 PAGE 1 OF 7

DETACHED LISIS

19404-10

B 34010

DWG NO. 10283761

SHEET	TITLE-1	PAGE 1 OF 7
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CYBER Interface Data Receive and Clock - A01-2

The following paragraphs describe the function of the components shown on the following page.

R1 Register

This register receives 12 data bits (Out 00 through Out 11) and an associated parity bit (Out Par) from the CYBER interface (I/F) channel during a write operation. The R1 register routes the data bits (R00 through R11) to a parity checker and the R2 register.

Parity Checker

The output parity bit (Out Par) from the CYBER I/F channel is compared with the parity bit from the parity generator. If the two bits do not compare, the channel parity error (Chan PE) flip-flop (FF) sets and a Chan PE signal is sent to the control-flag register (A04-3).

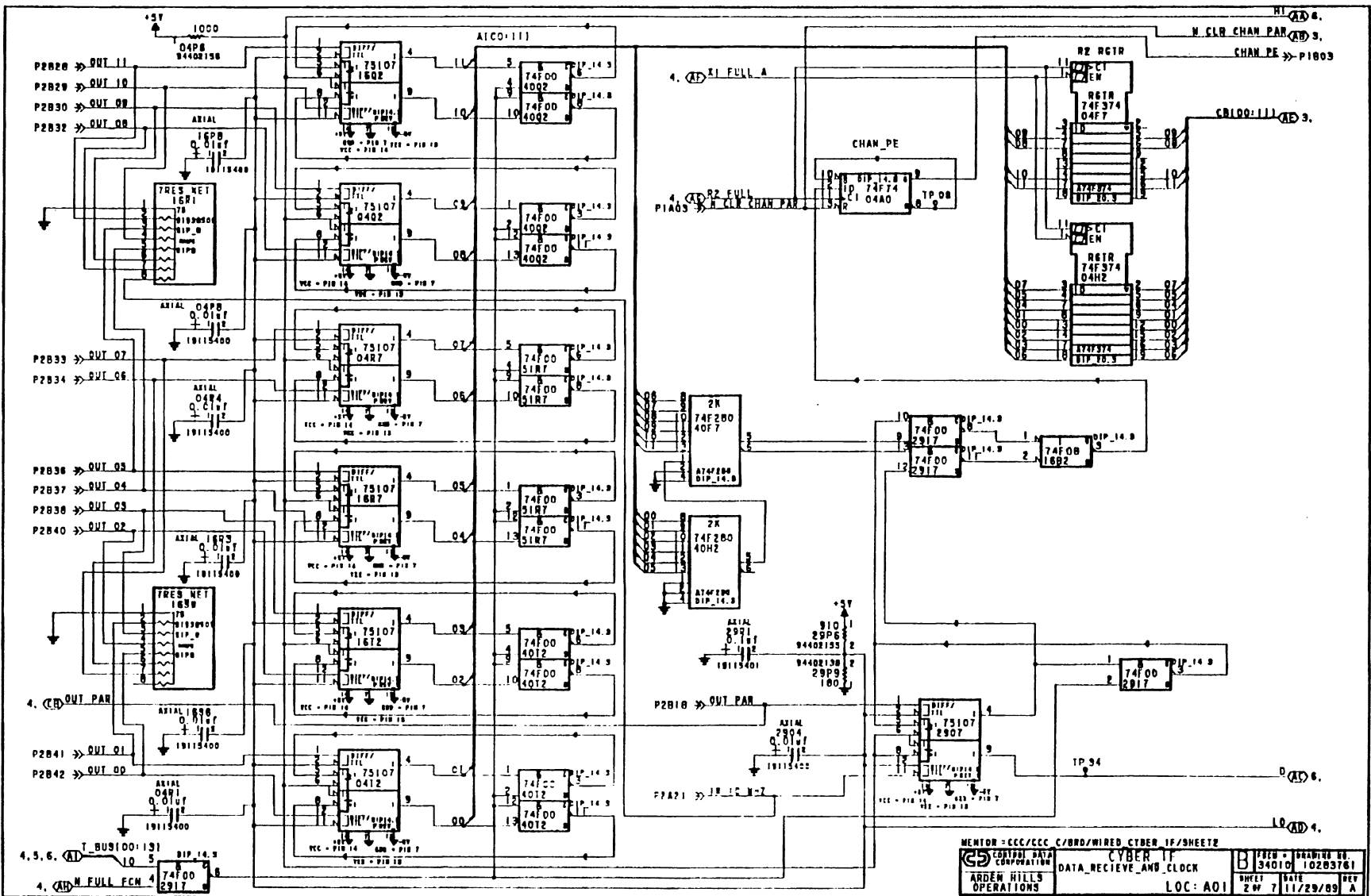
R2 Register

During a write operation, data bits R00 through R11 are held in this register and then placed onto the channel bus (A01-3) as data bits CB00 through CB11.

During a read operation, the X1 Full signal (A01-4) tristates the R2 register (A01-2) to place it in an off condition. This allows the read data from A02-3 to be placed onto the channel bus.

IN 10 MHz Clock

This channel clock signal is used to generate a 40-MHz clock and the T00, T25, T50, and T75 timing signals required for data control (A01-4).



CYBER Interface Data Transmit - A01-3

The following paragraphs describe the function of the components shown on the following page.

X2 Register

This register receives the 12 data bits of the channel word (CB00 through CB11) from the channel bus during a read operation. The X2 register routes the data bits (0 through 11) to a parity generator and associated driver circuits.

Driver

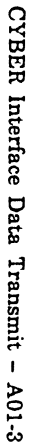
The driver circuits transmit the 12-bit channel words from the X2 register to the CYBER I/F channel. The X75 and X50 timing signals clock the positive-going half of the data bits (P00 through P11) and the negative-going half of the data bits (N00 through N11) through the driver and transformers, respectively.

Parity Generator

A parity bit is generated from the 12 channel bus data bits received from the X2 register. The parity bit (N Par or P Par) is gated through the driver circuit along with the data bits and is sent to the channel transmitters.

Channel Transmitters

These transmitters send the 12 data bits and associated parity bit to the CYBER I/F channel.



CYBER Interface Channel Control - A01-4

The following paragraphs describe the function of the components shown on the following page.

Channel Output Control Signals

Differential receivers receive the Out Function, Out Full, Out Active, Out Inactive, Out Empty, and Out MC (Master Clear) signals from the CYBER channel I/F. These signals set corresponding FFs except for the Out Inactive signal. The FF outputs are sent to the status circuits (A04-4) except for the Out MC signal which is sent to A04-3. The Out Inactive signal is used to clear the active FF.

Connect/Disconnect

The connect and disconnect FFs are set by a deadman timeout (DMTO) signal (A01-5) or a disconnect channel signal (AK03) from the CYBER channel I/F universal device interface (UDI) (A03-7). The disconnect FF clocks the active FF and gates the In Inactive signal through its transmitter to the CYBER I/F channel. The In Empty and In Full control signals are also sent to the CYBER channel I/F.

X2 Full/R2 Full

The X2 full and R2 full FFs control the data transfers during read and write operations, respectively.



CYBER Interface Pause and Deadman Timeout - A01-5

The following paragraphs describe the function of the components shown on the following page.

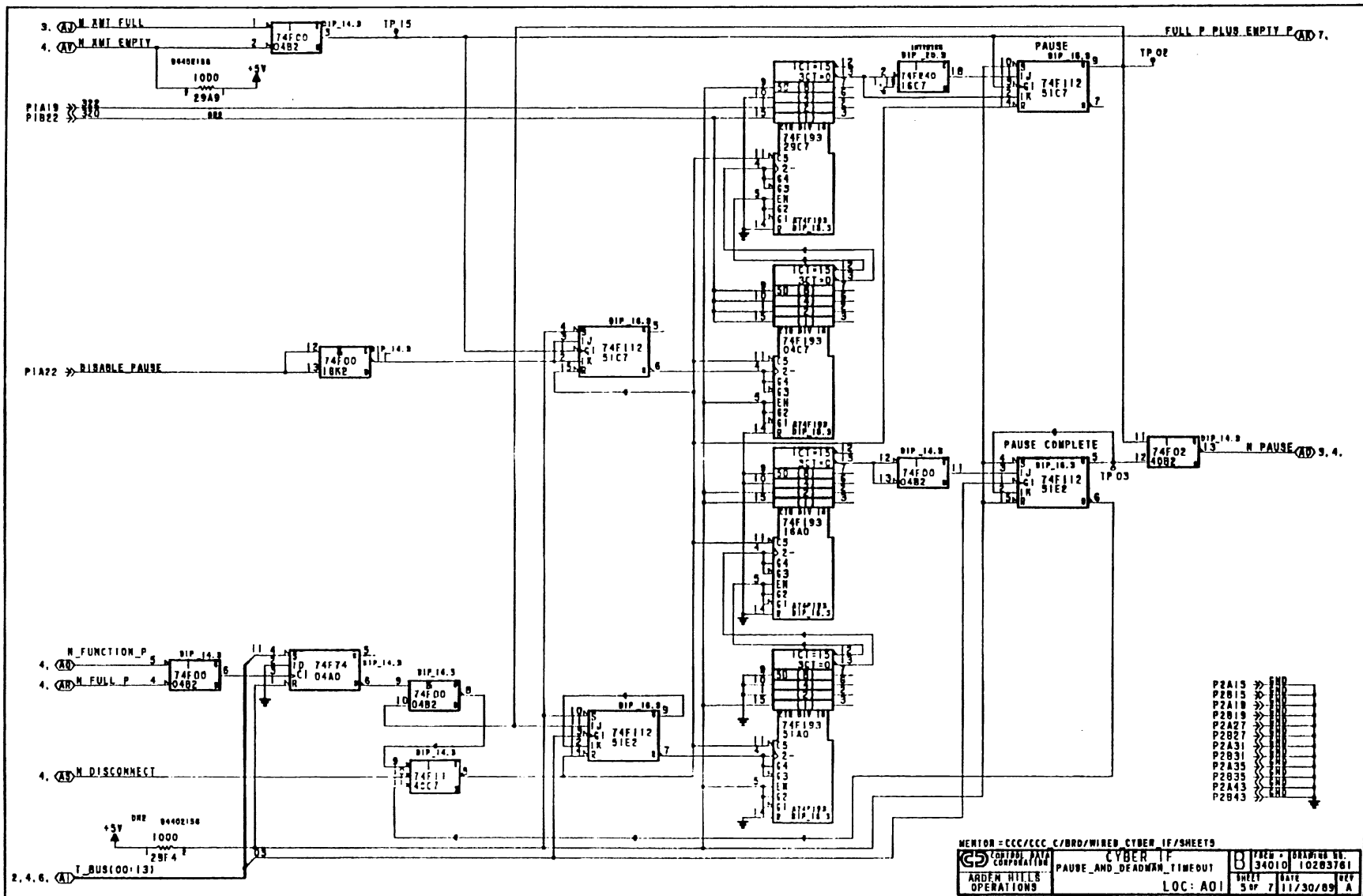
Pause

During a write operation, the pause FF sets when the CYBER channel I/F sends each group of 320 12-bit tape words. The pause FF clears in 10 ± 1 s (pause complete) or when the next Out Full signal (A01-4), or Out Function signal (A01-4) is sent by the CYBER channel I/F. Termination of the write operation is indicated when the pause FF is clear and the channel is inactive. This allows two peripheral processors to perform a chained write operation.

During a read operation, the CYBER interface pauses for 10 ± 1 s after sending each group of 320 12-bit tape words to the CYBER channel. This allows two peripheral processors to perform a chained read operation.

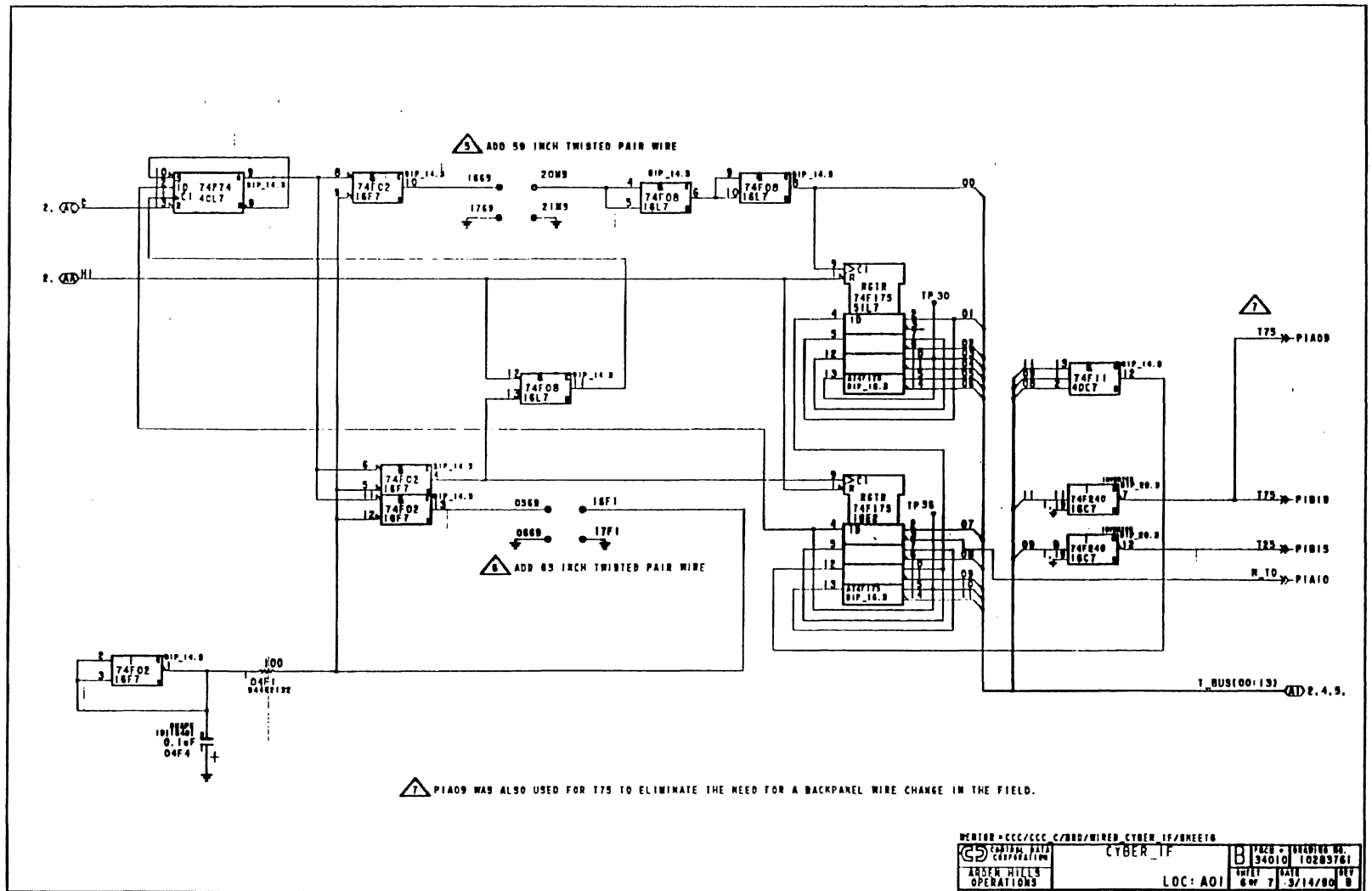
The pause FF also sets after the CYBER channel interface sends 322 12-bit disk words to the CYBER channel. The resulting Pause signal (A01-4) is sent to the status circuits (A04-4) where a Direct Memory Access (DMA) Complete signal is generated. This allows the microcode to disconnect the channel which, in turn, clears the pause FF.

Refer to DMTO discussion under C I/F - A01-7



CYBER Interface - A01-6

The CCC interface-channel logic diagram (location A01-6) is shown on the following page.

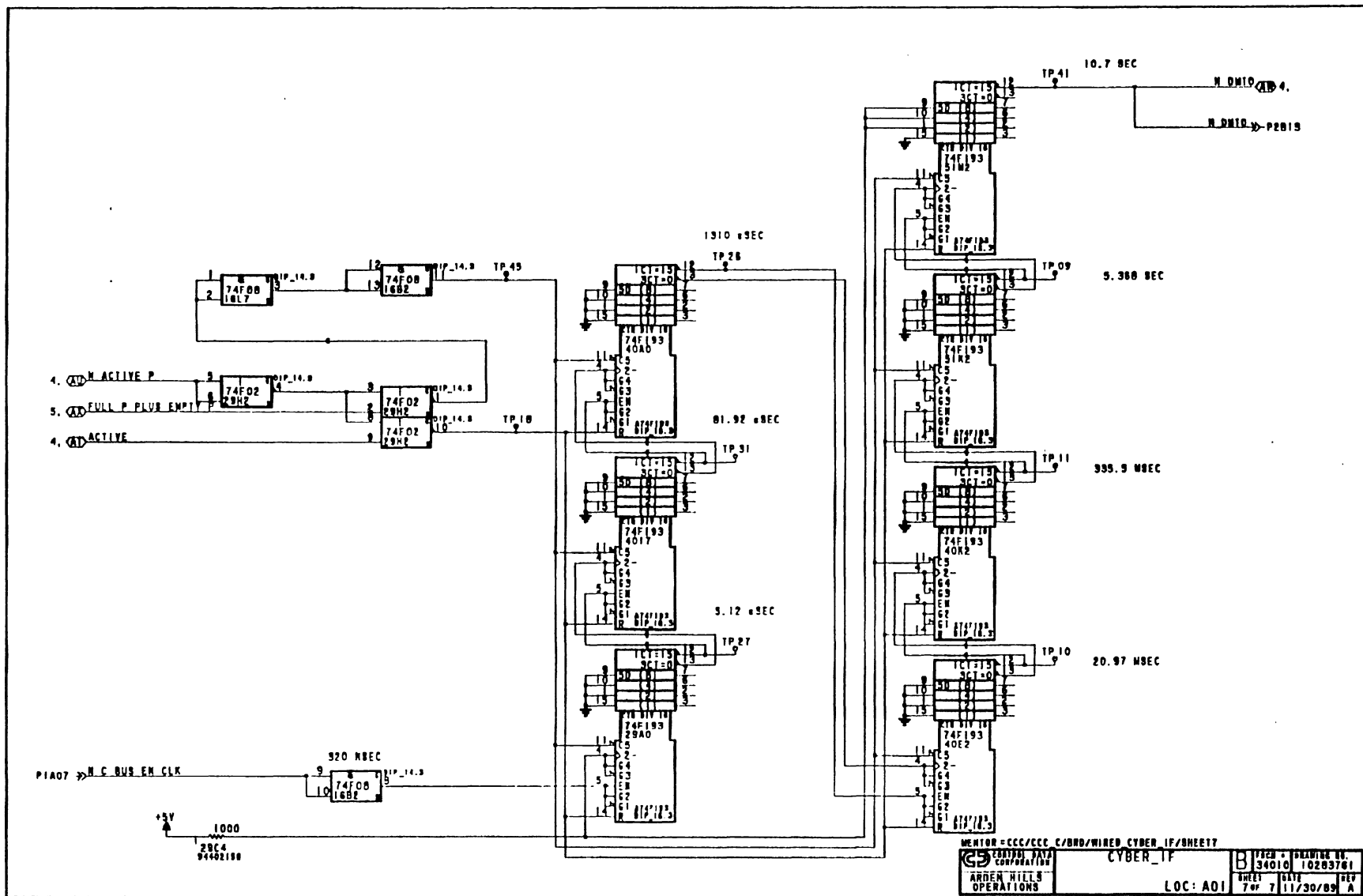


CYBER Interface - A01-7

The following paragraphs describe the function of the components shown on the following page.

Deadman Timeout

This circuit monitors an active channel for a hung condition during a read or write operation. If the channel does not transfer a word for 8.5 ± 1.5 s, the CYBER interface deactivates the channel (A01-4) and sets the deadman timeout FF (A04-3).



CYBER Bus Interface Logic Diagram - A02

The revision level for each sheet of the logic diagrams for CYBER Bus/Interface (location A02) are listed on the logic diagram cover sheet (the following page).

DETACHED LISTS

CYBER Bus Interface Write Path - A02-2

The following paragraphs describe the function of the components shown on the following page.

9-Track/Disk and 7-Track R3 Registers

These registers assemble data during 9-track tape/disk and 7-track tape direct-memory access (DMA) write operations. The registers receive 12-bit words (bits CB00 through CB11) from the CYBER channel bus.

The 9-track disk R3 register is a 24-bit register that assembles two 12-bit channel words into three 8-bit bytes to form 16-bit coupler memory words.

The 7-track R3 register is a 16-bit register that assembles one 12-bit channel word into two 8-bit bytes to form 16-bit coupler memory words. The upper two bits of the 8-bit bytes are not used (forced to zeros).

Data is gated from the R3 register to the DMA T register in 8-bit bytes. For 8-bit channels, the 8-bit byte is stored simultaneously in both the upper byte (bits 0 through 7) and lower byte (bits 8 through 15) of the DMA T register. Both bytes are sent to the data bus transmitters (A02-4) and written into memory (A07-3), but only the upper byte is used. For 16-bit channels, the 8-bit bytes are assembled a byte at a time beginning with the upper byte of the DMA register. Both bytes are then written into memory and the whole word (16 bits) is used. If an odd number of bytes is to be written, the lower byte of the DMA T register is zero-filled before being transferred to memory and an Odd Byte Write signal (A02-6) is sent to the transfer logic (A08-7).

UDI R3 Register

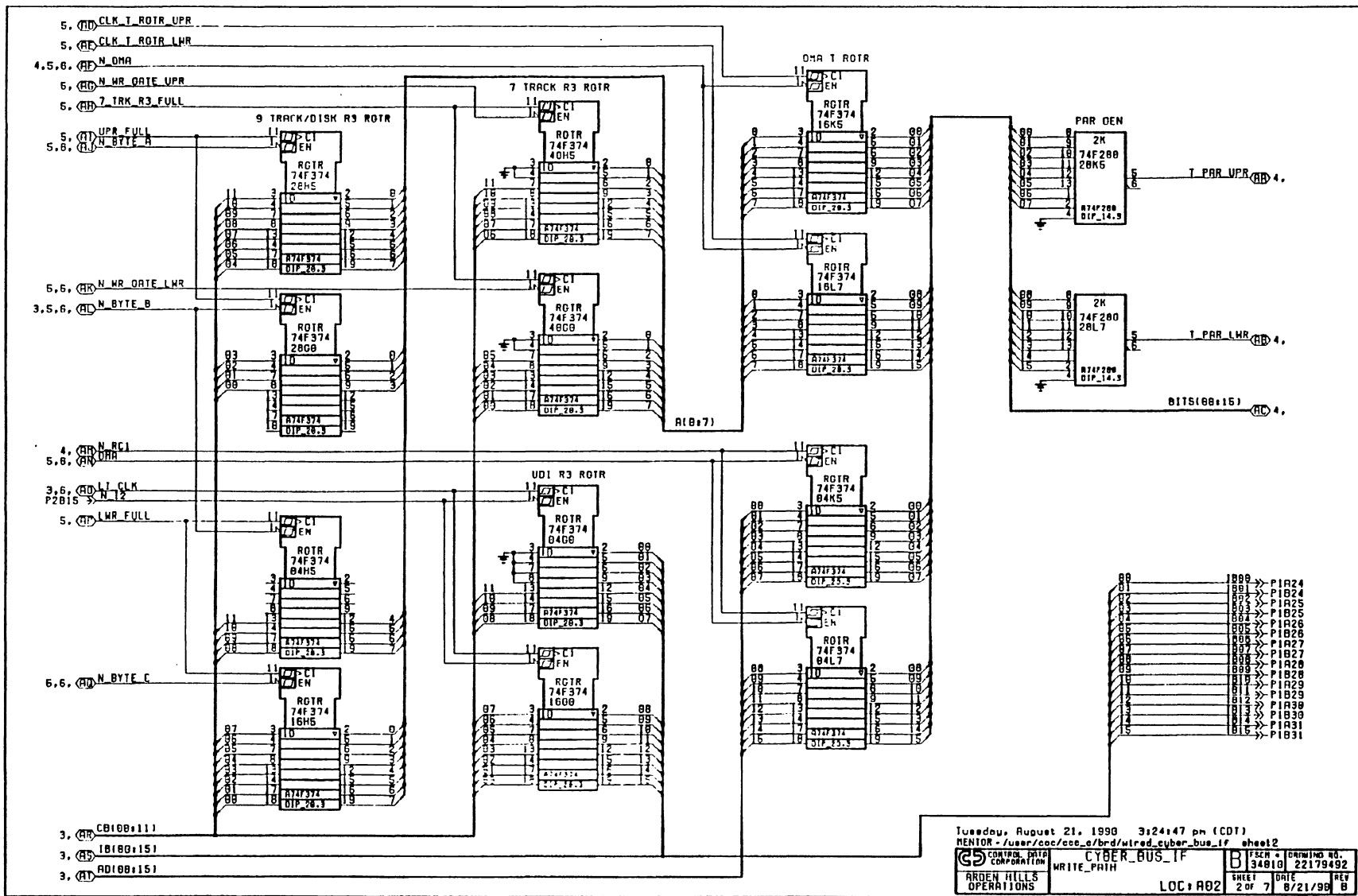
This 16-bit register is used during a UDI write operation. This register receives 12-bit channel words (bits CB00 through CB11) from the CYBER channel bus. This register sends 12-bit channel words (bits IB04 through IB15) to the UDI (A03-2) for assembly into 16-bit coupler memory words. These 16-bit words are routed from the UDI through the UDI T register and data-bus transmitters (A02-4) and written into memory (A07-3).

DMA and UDI T Registers

The DMA T register assembles words directly from the 9-track/disk and 7-track R3 registers. The UDI T register receives the assembled words (bits AD00 through AD15) from the UDI (A03-4). The upper and lower 8-bit data bytes are sent to parity generators and data-bus transmitters (A02-4).

Parity Generation

Parity bits are generated (odd parity) for each upper and lower 8-bit data byte sent by the T registers. The parity bits are sent with the data bytes to the data-bus transmitters (A02-4).



CYBER Bus Interface Read Path - A02-3

The following paragraphs describe the function of the components shown on the following page.

DB1 Register

This register receives 16-bit coupler memory words (bits DB00 through DB15) from the data-bus receivers (A02-4) during a DMA- or UDI-read-operation. The DB1 register sends the 16-bit words to the 16-to-8 mux for a DMA-read operation, the DB2 register for a UDI-read operation, and the parity-check circuit (A02-4).

16 to 8 Mux

This multiplexer selects the upper 8-bit bytes (bits 0 through 7) or lower 8-bit bytes (bits 8 through 15) of the 16-bit coupler memory words during a DMA-read operation. Only the upper bytes are selected for 8-bit read mode. The Odd Byte signal (A02-5) gates the lower byte through the multiplexer in 16-bit read mode. The multiplexer sends the 8-bit bytes to the 9-track/disk and 7-track X1 registers.

DB2 Register

This register receives 16-bit coupler memory words from the DB1 register during a UDI-read operation. The register sends the 16-bit coupler memory words to the UDI (A03-2) for disassembly.

9-Track/Disk and 7-Track X1 Registers

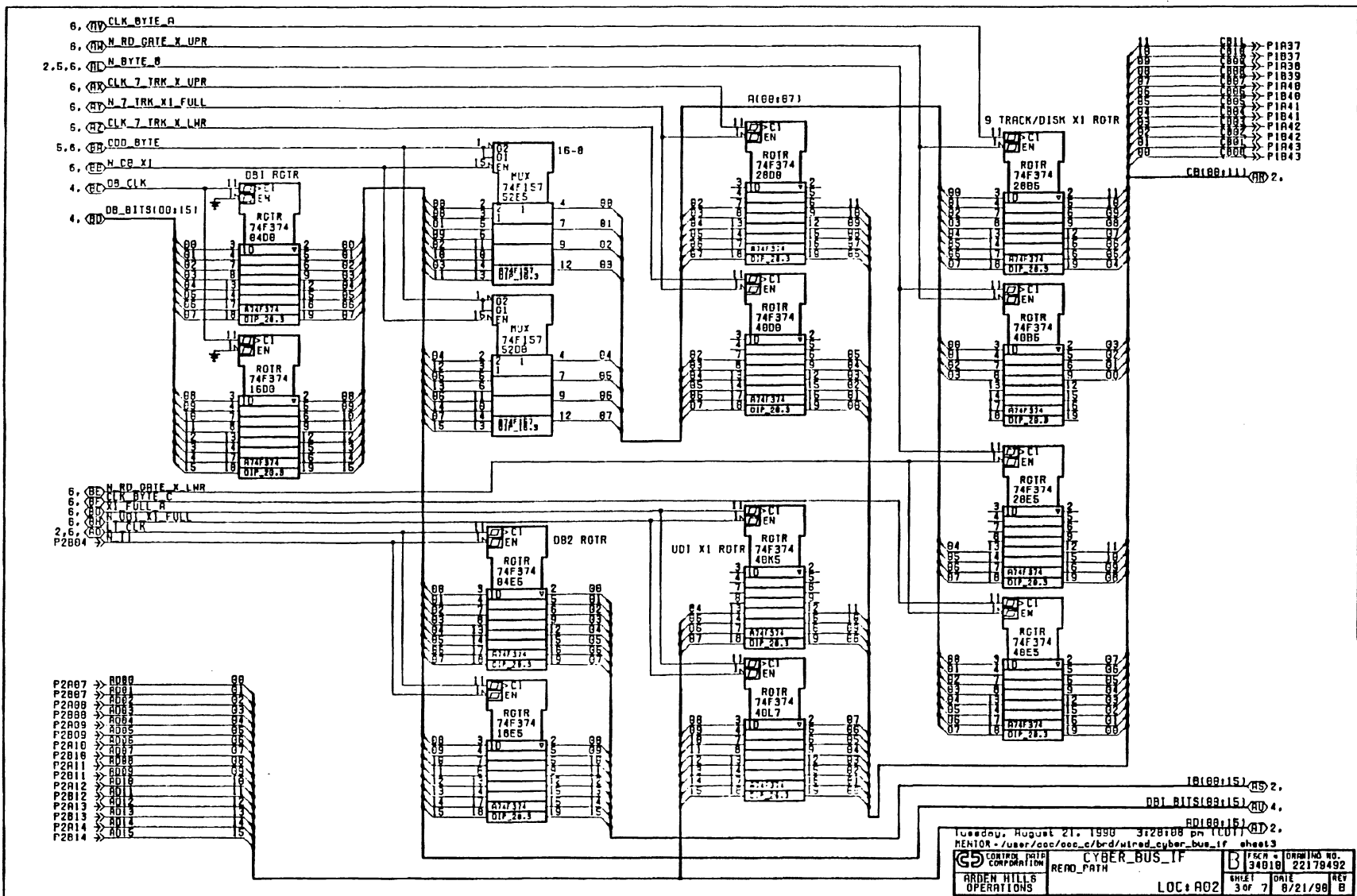
These registers disassemble data during 9-track tape/disk and 7-track tape DMA-read operations. The registers receive 8-bit bytes from the 16- to 8-bit multiplexer.

The 9-track/disk X1 register is a 24-bit register that disassembles three 8-bit coupler memory bytes into two 12-bit channel words. The 7-track X1 register is a 16-bit register that disassembles two 8-bit coupler memory bytes into one 12-bit channel word. The upper two bits of the coupler memory bytes are not used.

The 12-bit channel words are sent from the X1 registers to the channel bus and routed through the X2 register (A01-3) and channel transmitters (A01-3) for transmission to the CYBER channel I/F.

UDI X1 Register

This 16-bit register is used during a UDI-read operation. The register receives 12-bit channel words (bits AD04 through AD15) from the UDI-disassembly circuit (A03-4). The 12-bit channel words are sent from the UDI X1 register to the CYBER channel in the same manner as those from the 9-track/disk and 7-track X1 registers.



CYBER Bus Interface Data Bus Control – A02-4

The following paragraphs describe the function of the components shown on the following page.

Data-Bus Transmitters

During a coupler write operation, assembled 16-bit words from the DMA or UDI T register (A02-2) and two parity bits are sent to the transmitters and placed onto the bidirectional data bus. The 16-bit words and parity bits are then written into memory (A07-3).

Data-Bus Receivers

During a coupler read operation, 16-bit words and two parity bits are read from memory onto the data bus and sent to the receivers on the same bidirectional pins used by the data-bus transmitters. The receivers send the 16-bit coupler memory word to the DB1 register (A02-3) and the parity-check circuit along with the two parity bits.

Parity Check

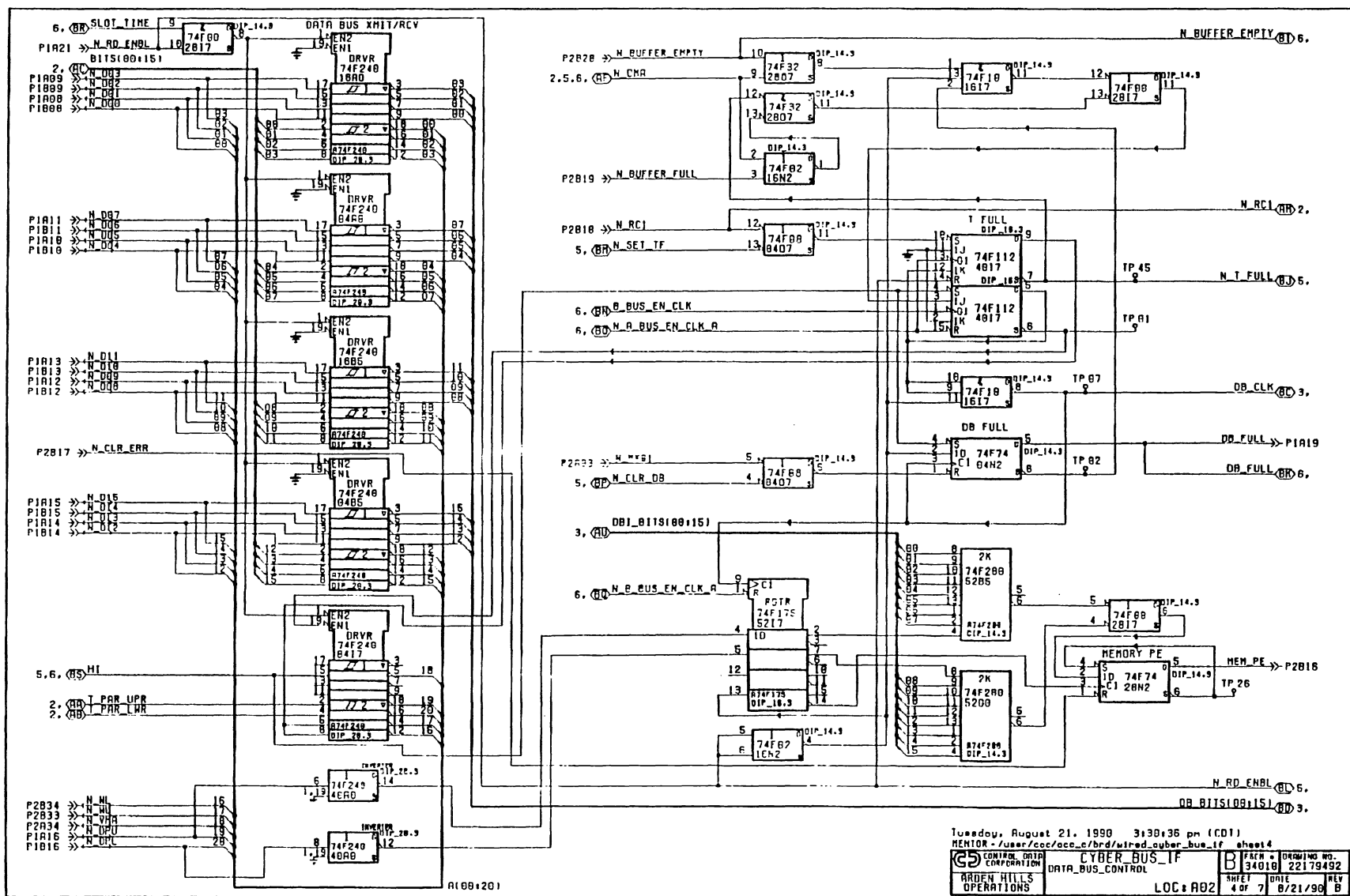
A check for odd parity is performed on the upper and lower 8-bit bytes of the 16-bit coupler memory word from the DB1 register (A02-3) and the associated parity bits from the 520S register. A parity error sets the memory parity FF, and a Mem PE (Memory Parity Error) signal is sent to the control flag register (A04-3).

Data-Bus Control Signals

The valid memory address (VMA) FF enables transfer of memory data during coupler read and write operations.

The DB Full FF and Buffer Empty signal (A08-5) control data transfers during a coupler-read operation.

The T full FF and Buffer Full signal (A08-5) control data transfers during a coupler-write operation.



CYBER Bus Interface Data-Write Control - A02-5

The following paragraphs describe the function of the components shown on the following page.

Data Write Control

This logic provides the signals needed to control data transfers during a coupler-write operation. Some signals are also used during coupler-read operations.

The outputs of the A, B, and C byte FFs and 9-track/disk R3 upper and lower full FFs on this diagram (A02-5) gate 8-bit data bytes through the 9-track/disk R3 registers (A02-2).

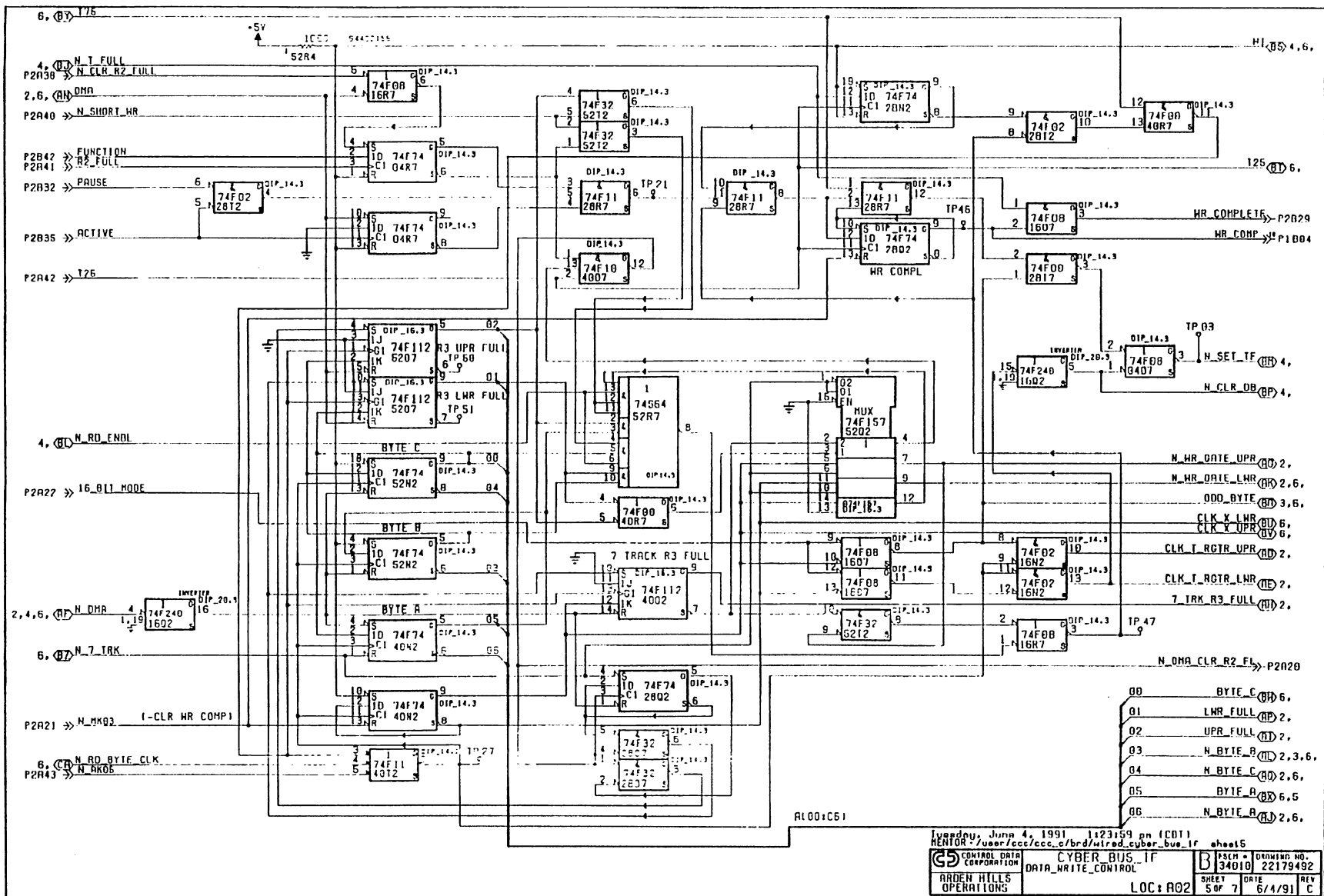
The output of the 7-track R3 full FF and the Write Gate Upper and Write Gate Lower signals gate 8-bit data bytes through the 7-track R3 register (A02-2).

The Clock T Register Upper and Clock T Register Lower signals clock 8-bit data bytes into the DMA T register (A02-2).

The output of the write complete FF informs the CYBER channel interface (A04-4), the FIPS stream logic (A10-2), and the FIPS transfer logic (A10-7) that the write operation is finished.

The outputs of the A, B, and C byte FFs are also sent to the DMA-read-control circuit (A02-6) for gating 8-bit bytes into the 9-track/disk X1 register.

The Clock X Upper and Clock X Lower signals are used to gate two 8-bit bytes into the 7-track X1 register for DMA read control (A02-6).



CYBER Bus Interface DMA Read Control - A02-6

The following paragraphs describe the function of the components shown on the following page.

DMA Read Control

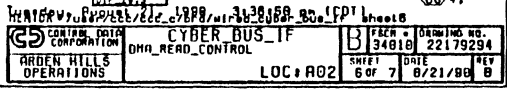
The DMA-read-control logic provides the signals needed to control data transfers during a DMA-read operation.

The output of the X1 full FF enables data to transfer from the UDI, 7-track or 9-track/disk X1 register (A02-3) to the CYBER channel bus.

The Clock Byte A and Clock Byte C signals are used to gate data into the 9-track/disk X1 register (A02-3). The Read Gate X Upper and Read Gate X Lower signals gate data from the 9-track/disk X1 register (A02-3), onto the channel bus, and to the X2 register (A01-3).

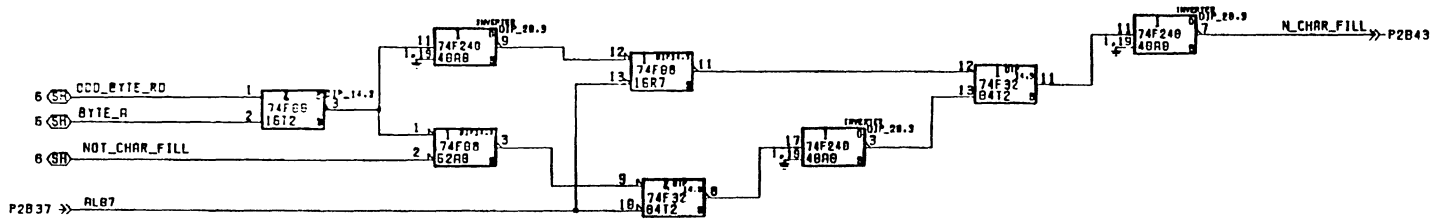
The Clock 7-Track X Upper and Clock 7-Track X Lower signals gate data into the 7-track X1 register (A02-3). The 7-Track X1 Full signal gates data from the 7-track X1 register, onto the channel bus, and to the X2 register (A01-3).

The X1 Full signal latches data from the UDI assembly/disassembly register (A03-4) into the UDI X1 register (A02-3). The UDI X1 Full signal gates data from the UDI X1 register, onto the channel bus, and to the X2 register (A01-3).



CYBER Bus Interface - A02-7

The CCC interface-channel logic diagram (location A02-7) is shown on the following page.



Tuesday, August 21, 1990 9:58:51 pm (CDT)
 REHIOX - /user/ccs/ccs-a/brd/wired_cyber_bus_tf sheet7
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 ARDEN HILLS OPERATIONS
 LOC: A02
 B 34818 22179492
 7 of 7 8/21/90 B

CYBER 2K-UDI Logic Diagram - A03

The revision level for each sheet of the CYBER 2K-UDI logic diagrams (location A03) are listed on the logic diagram cover sheet (the following page).

PAGE										REVISION RECORD								
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B	B	B	B	B	B	B	B	B	B	B	B	B	CA48033	ADD COVER, RE-INTER-SHEET	YES	01/20/81	NS	NS
B	B	B	B	B	B	B	B	B	B	B	B	B	CA48032	NEW PRA NUMBER	YES	01/11/81	NS	NS
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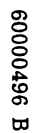
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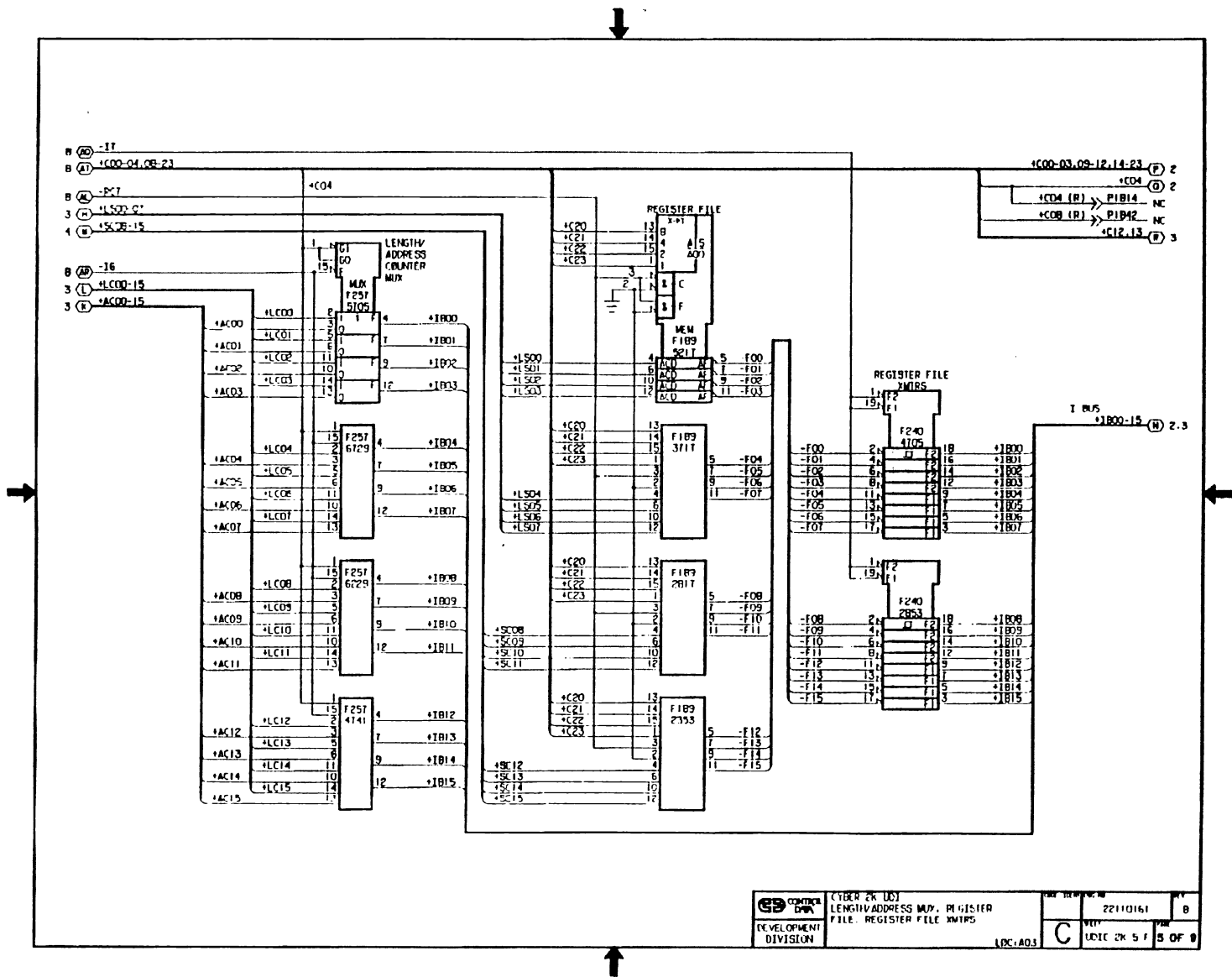
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UNITED STATES GOVERNMENT CLASSIFICATION AND CONTROL		OWN M E STIMMOT	DEV OB/06	CONTROL DATA APPROVED FOR RELEASE ST PAUL, MINN.
CLASS SECRET	CONTROL SECRET	DEV L B ULTIG	DEV OB/06	
PLANT SECRET	PLANT SECRET	DEV R J PILLARD	DEV OB/06	LOGIC DIAGRAM CYBER 2K UDI PRA-10284351 PRO-5104086
INTENT SECRET	INTENT SECRET	DEV L B ULTIG	DEV OB/06	
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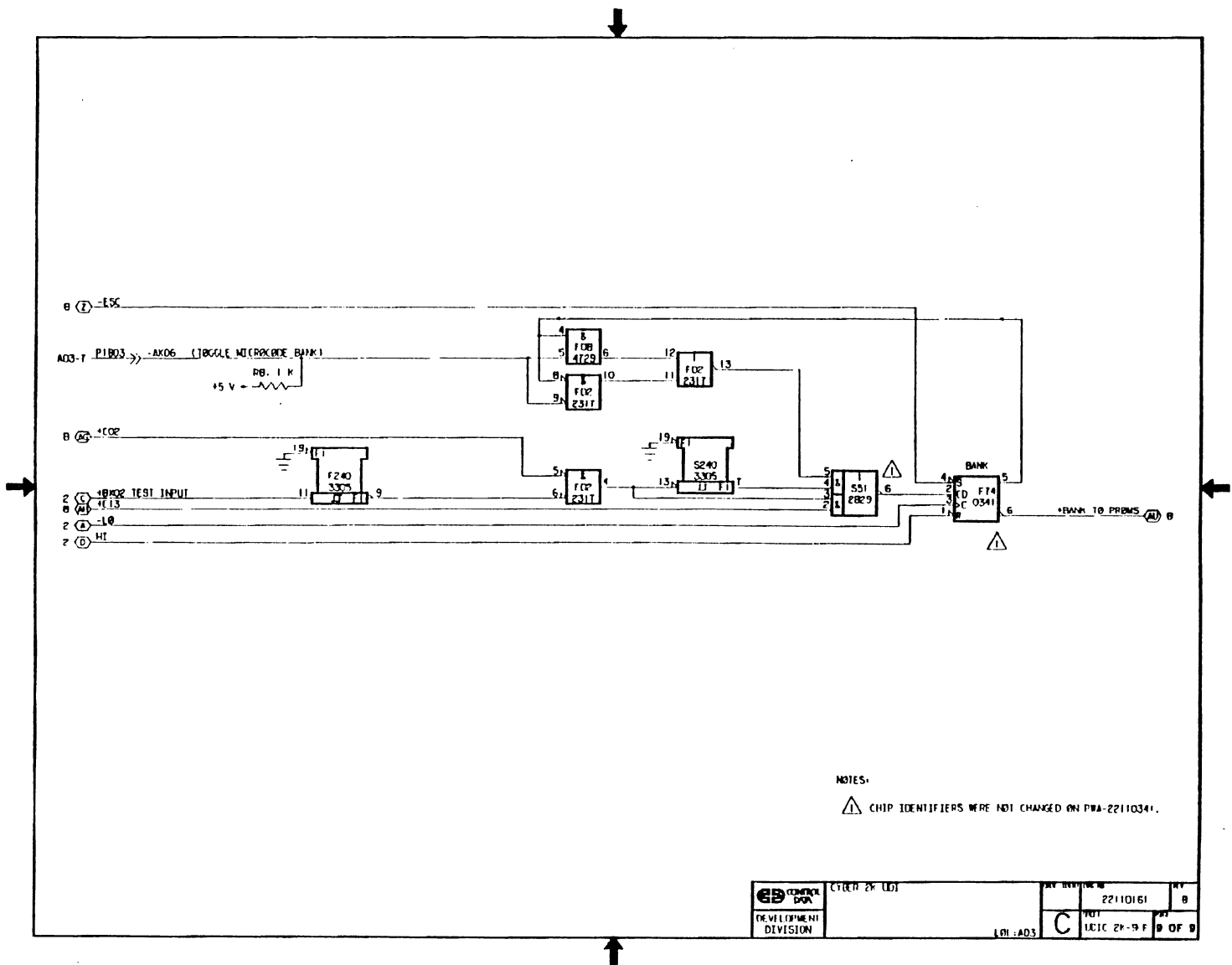












CYBER Status/Clock Logic Diagram - A04

The revision level for each sheet of the CYBER status/clock logic diagrams are listed on the logic diagram cover sheet (the following page).

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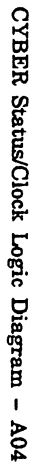
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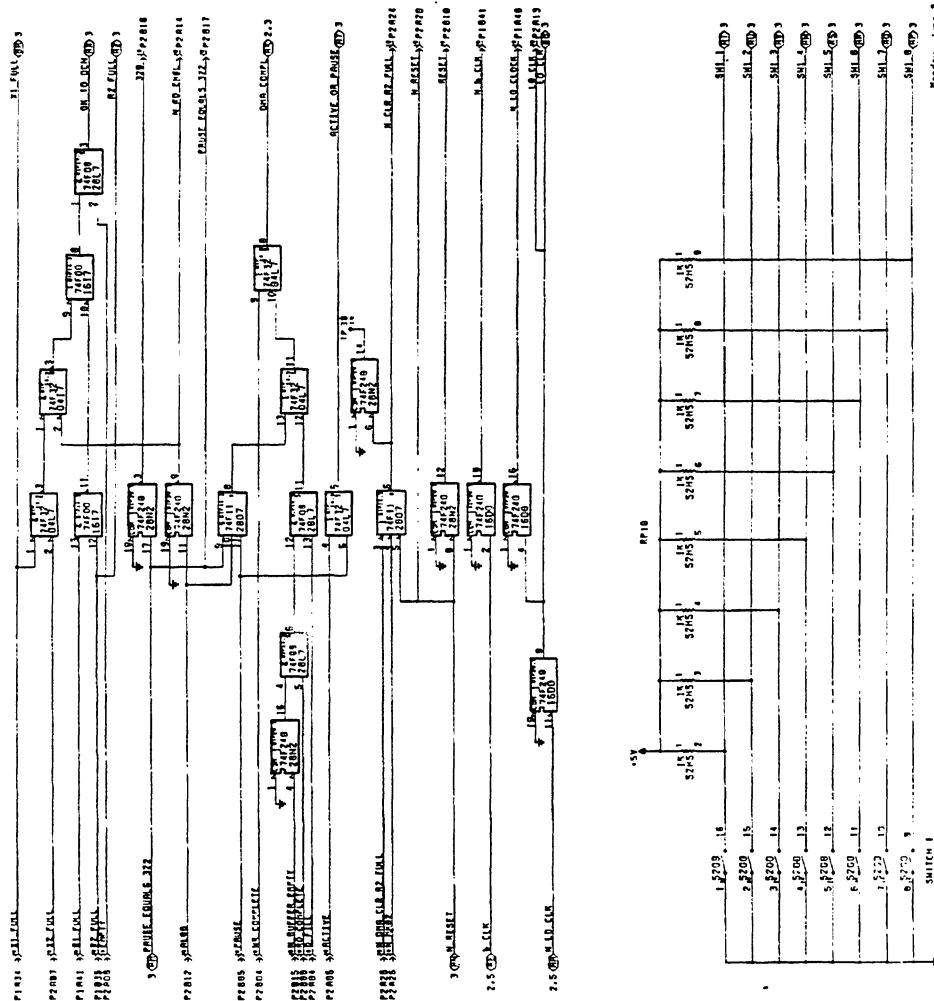
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SSN	D M WITZKE	6/4/91	
LNCR	D M WITZKE	6/4/91	
PID	J SPEIGEL	6/4/91	
GPV	D M WITZKE	6/4/91	

DETACHED LISTS

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19404-10	C	34010	10383559
SHEET		TITLE-1	PAGE 1 OF 5







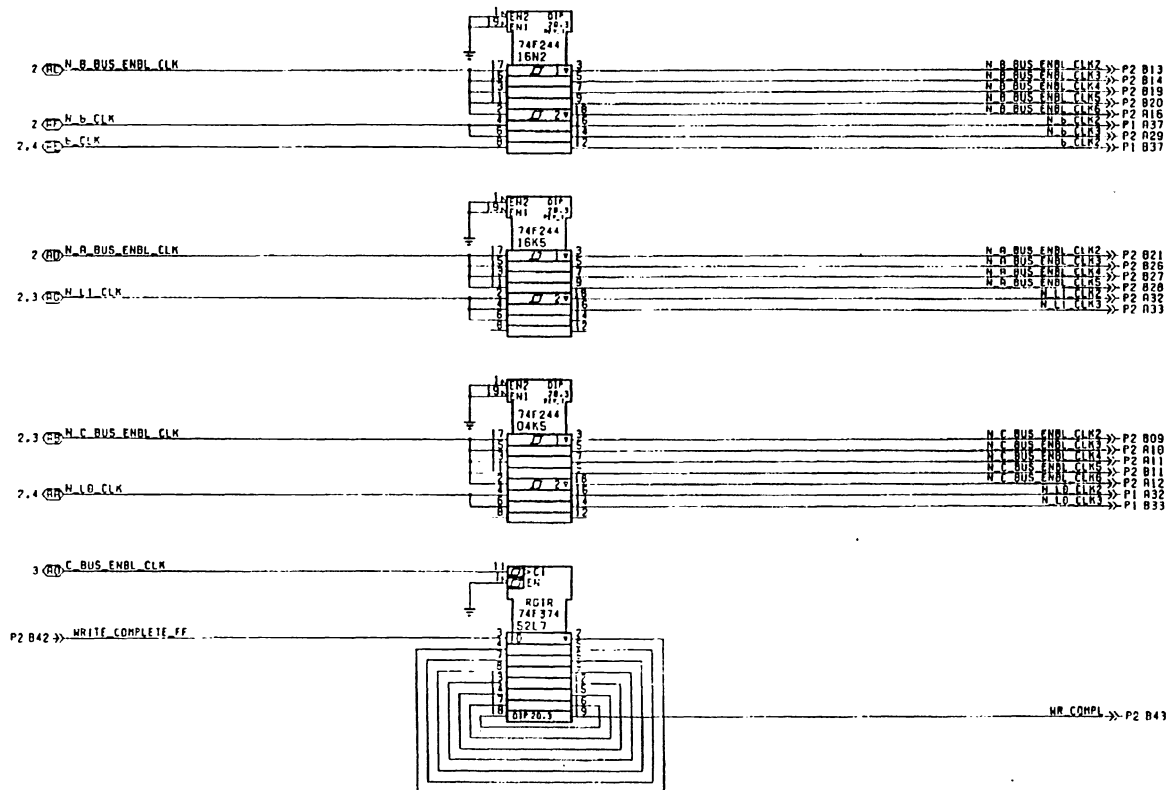
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PLMICH - /voo-/coo/cco_e/b/d/yybe, statue, sheep

170 7041902
SYNTHESIS
170 7041902

LOC: 301

Abstract—The purpose of this study was to determine the effect of a 12-week training program on the heart rate (HR) and energy expenditure (EE) of sedentary, middle-aged women. The subjects were 12 women, 40 to 50 years of age, who were sedentary and had no cardiovascular disease. They were randomly assigned to either a control group or a training group. The control group continued their sedentary lifestyle, while the training group participated in a 12-week program of aerobic exercise. The HR and EE were measured at rest and during a submaximal exercise test at baseline and at the end of the 12-week program. The results showed that the training group had a significant decrease in HR and a significant increase in EE compared to the control group. These findings suggest that a 12-week training program can improve cardiovascular fitness and increase energy expenditure in sedentary, middle-aged women.

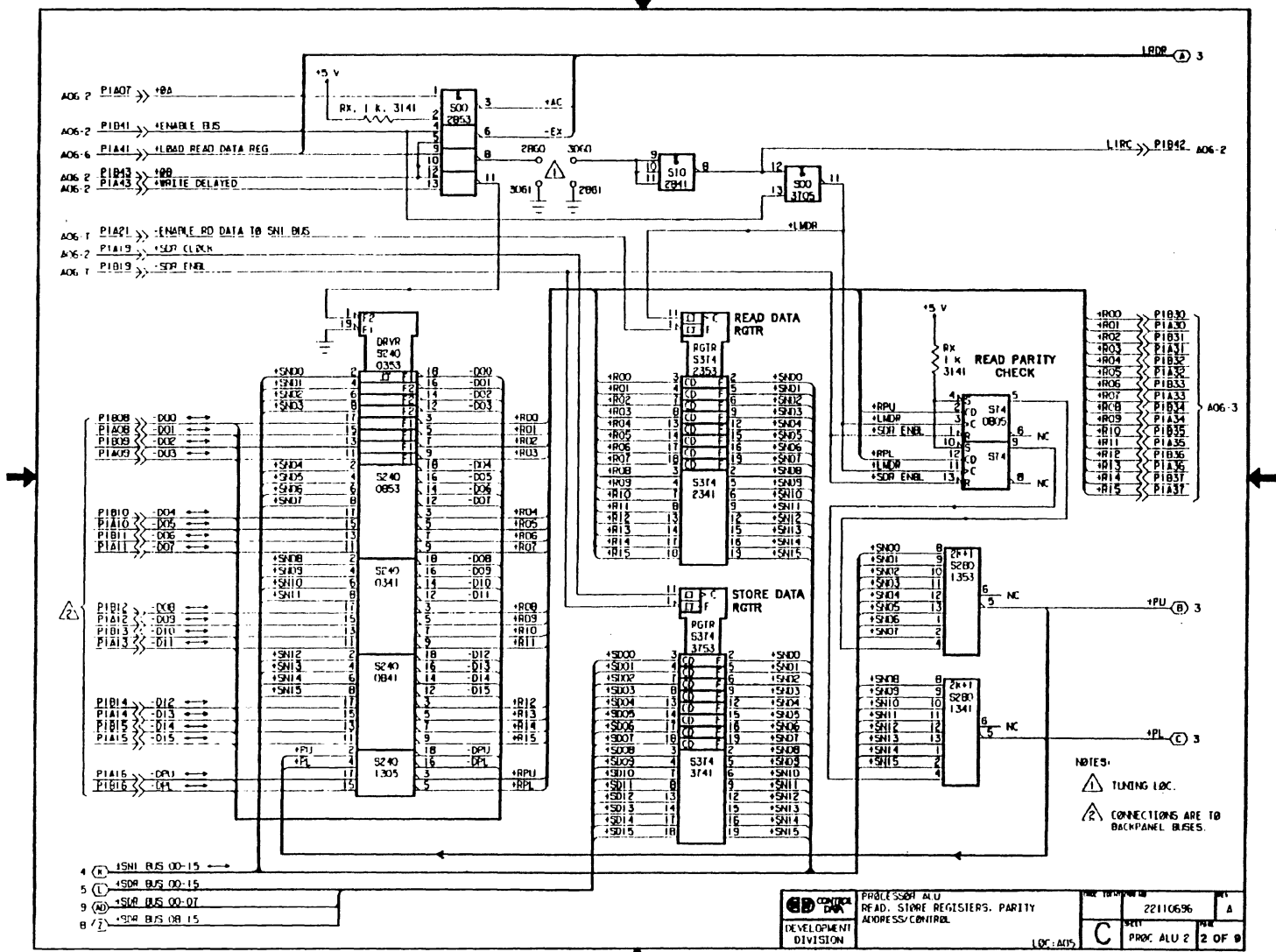


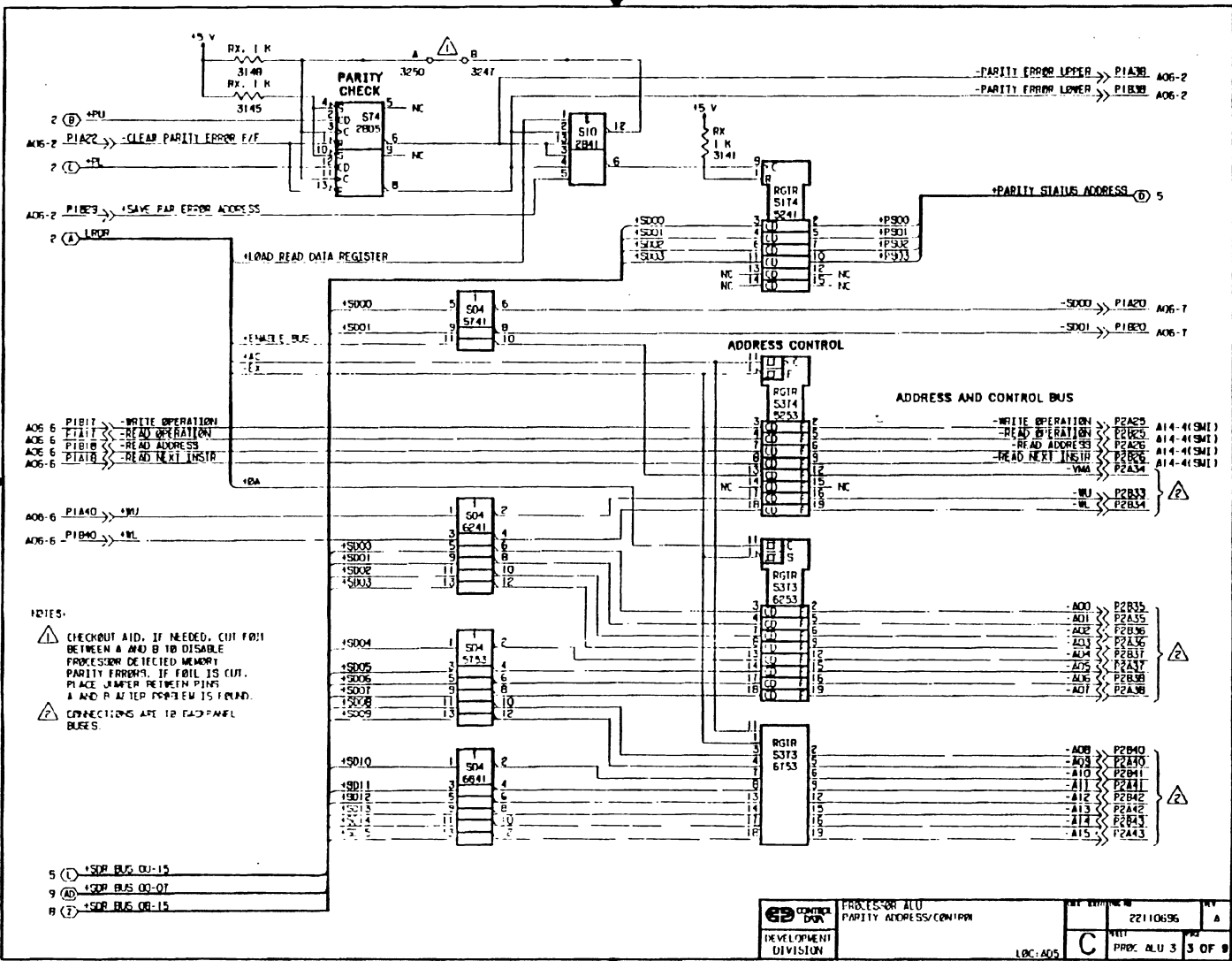
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 CLOCK FANOUT DRIVERS/
 WRITE COMPLETE DELAY
 LOC: A04
 SHEET 507 5
 DATE
 REV R

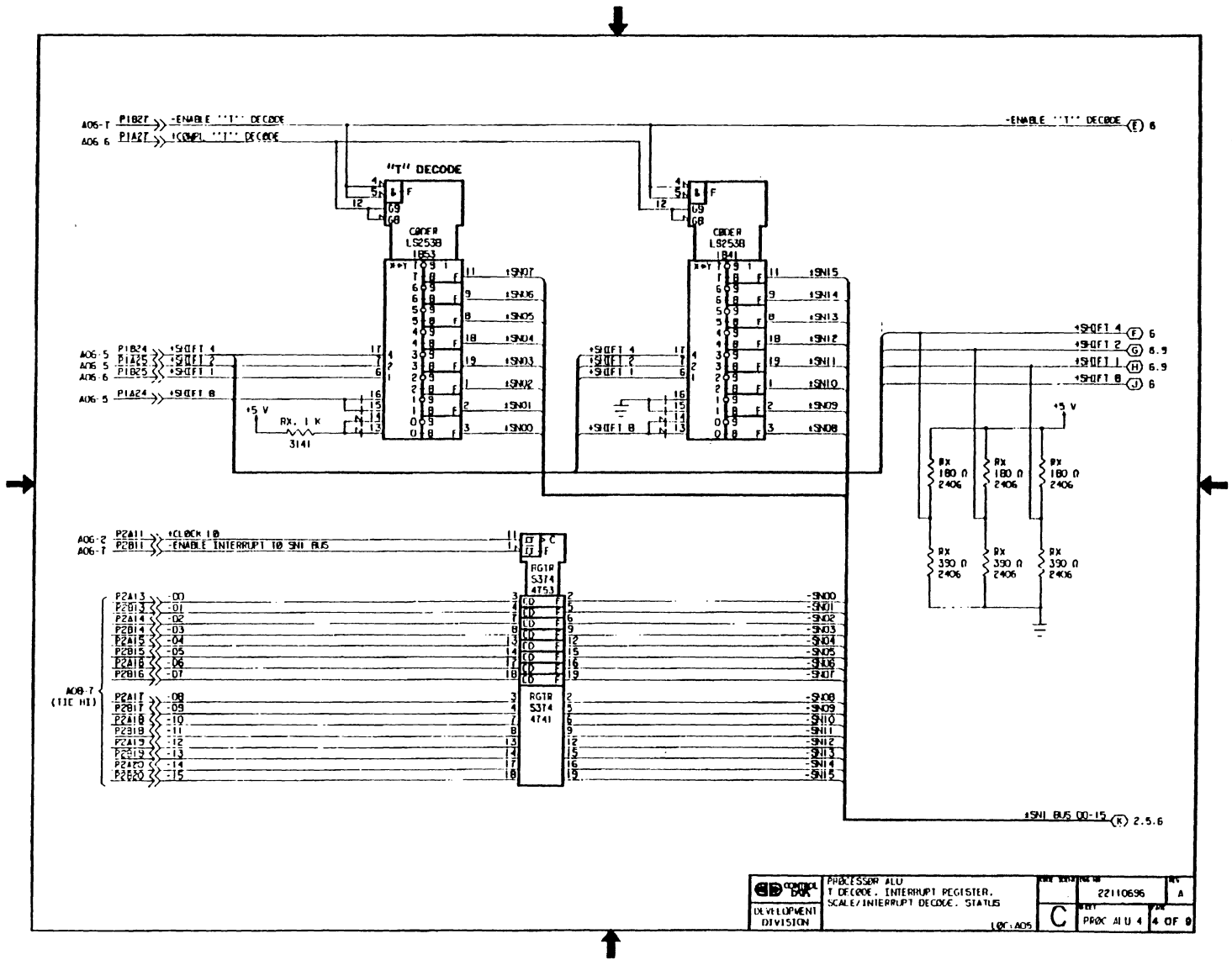
Processor ALU Logic Diagram - A05

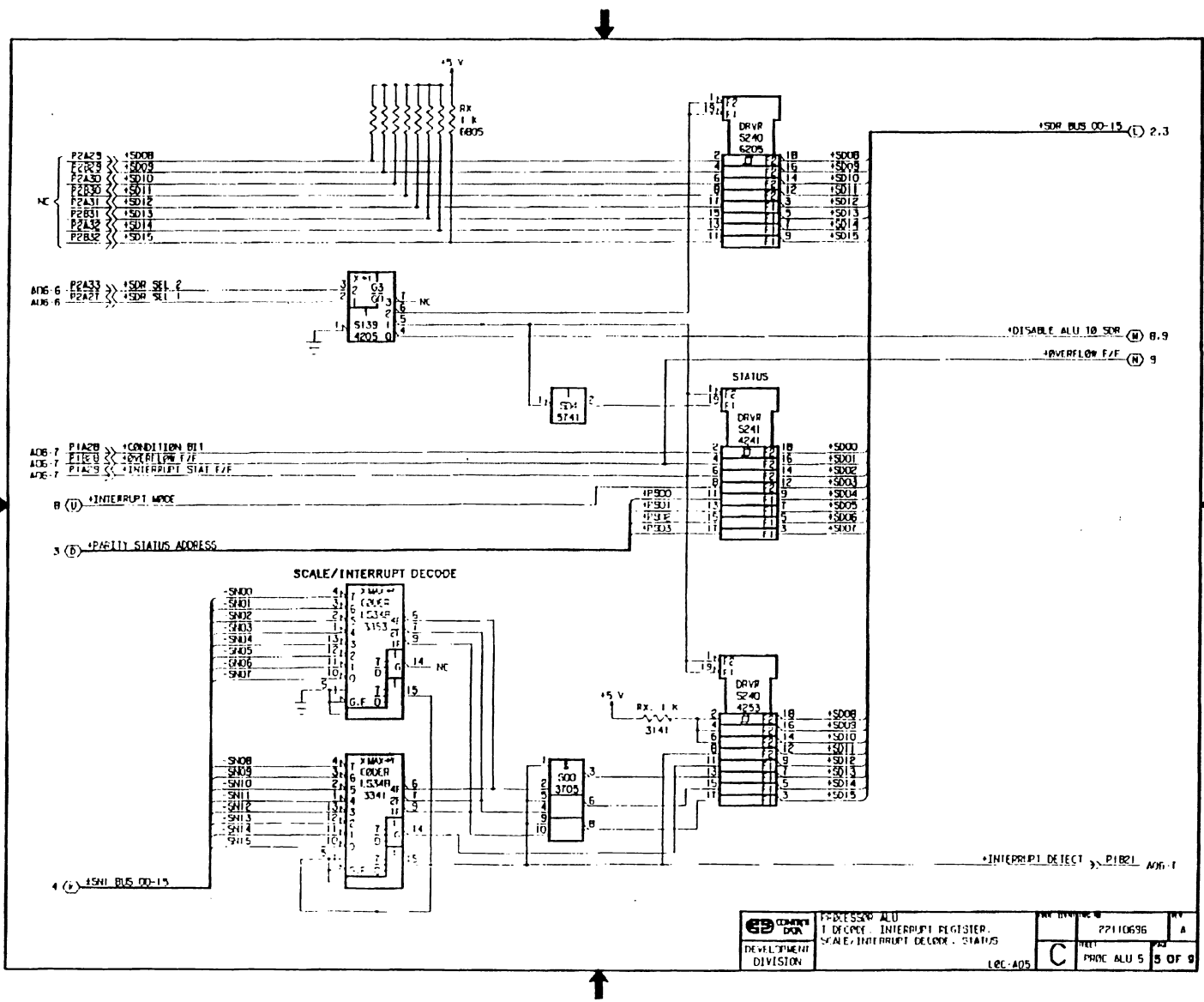
The processor arithmetic logic unit (ALU) is an internally programmed, parallel-mode device that controls basic internal operations on the data bus, CYBER channel interface, and FIPS device interface of the coupler. For details of operation, including the internal instruction set of the processor, refer to appendix B of the CYBER Channel Coupler 19404-1/2/3/10/11/12 Hardware Reference Manual listed under Related Manuals in About This Manual.

The revision level for each sheet of the processor ALU logic diagrams (location A05) are listed on the logic diagram cover sheet (the following page).

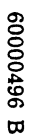


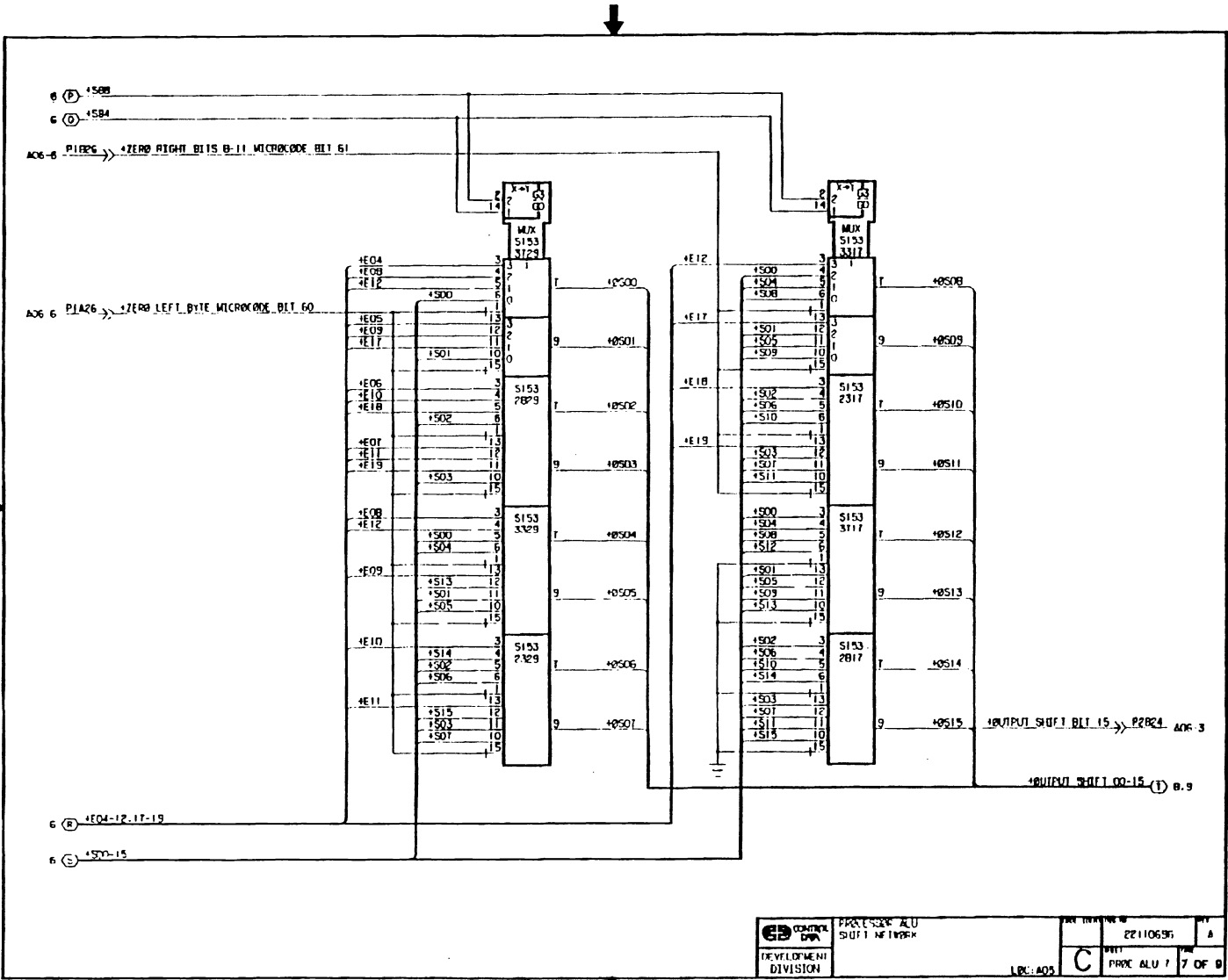


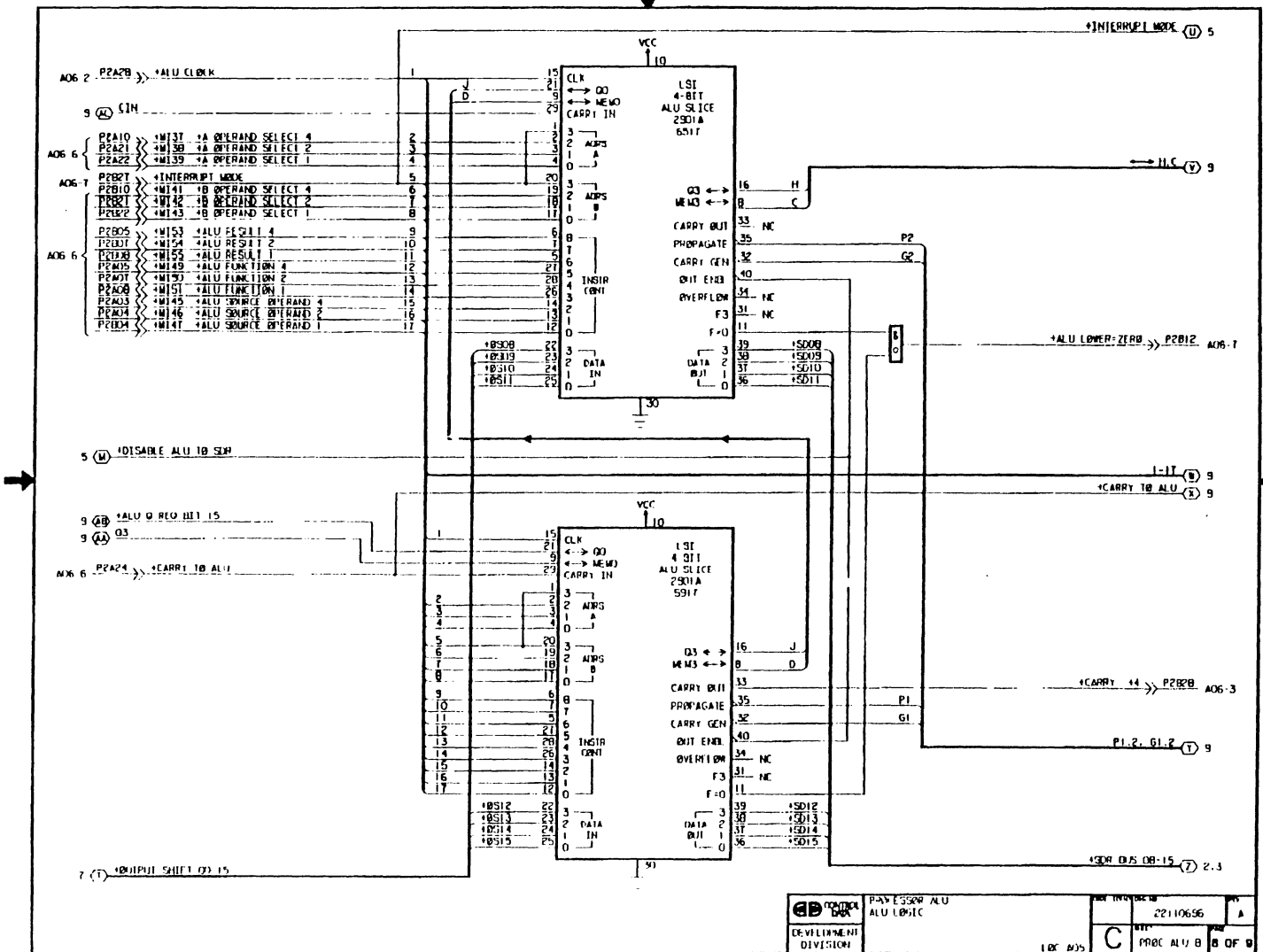


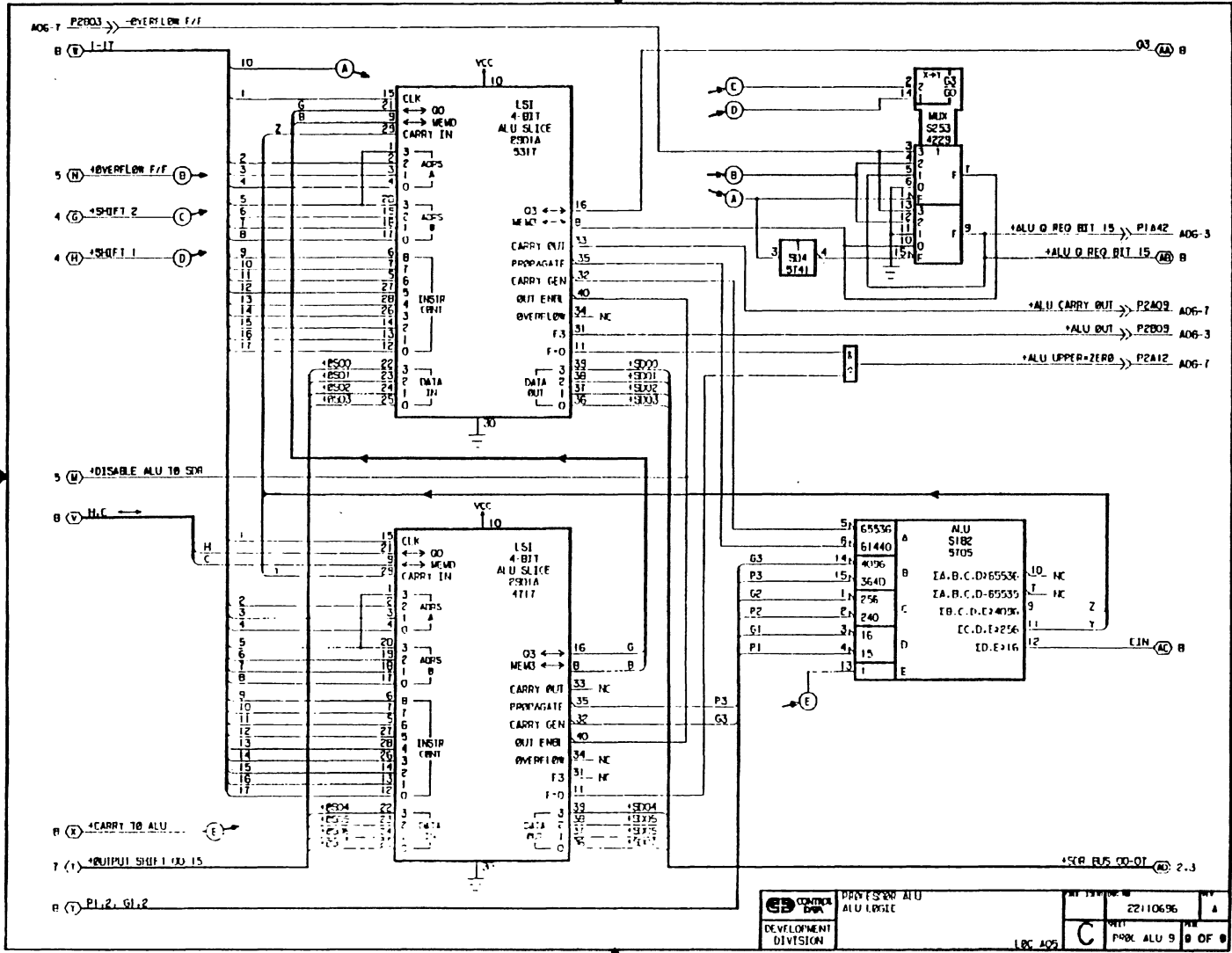


	PROCESSOR ALU	77110696		A
	1 DECODE, INTERRUPT REGISTER, SCALE/INTERRUPT DECODE, STATUS			
DEVELOPMENT DIVISION	LOC-A05	C	PREC ALU 5	5 OF 9







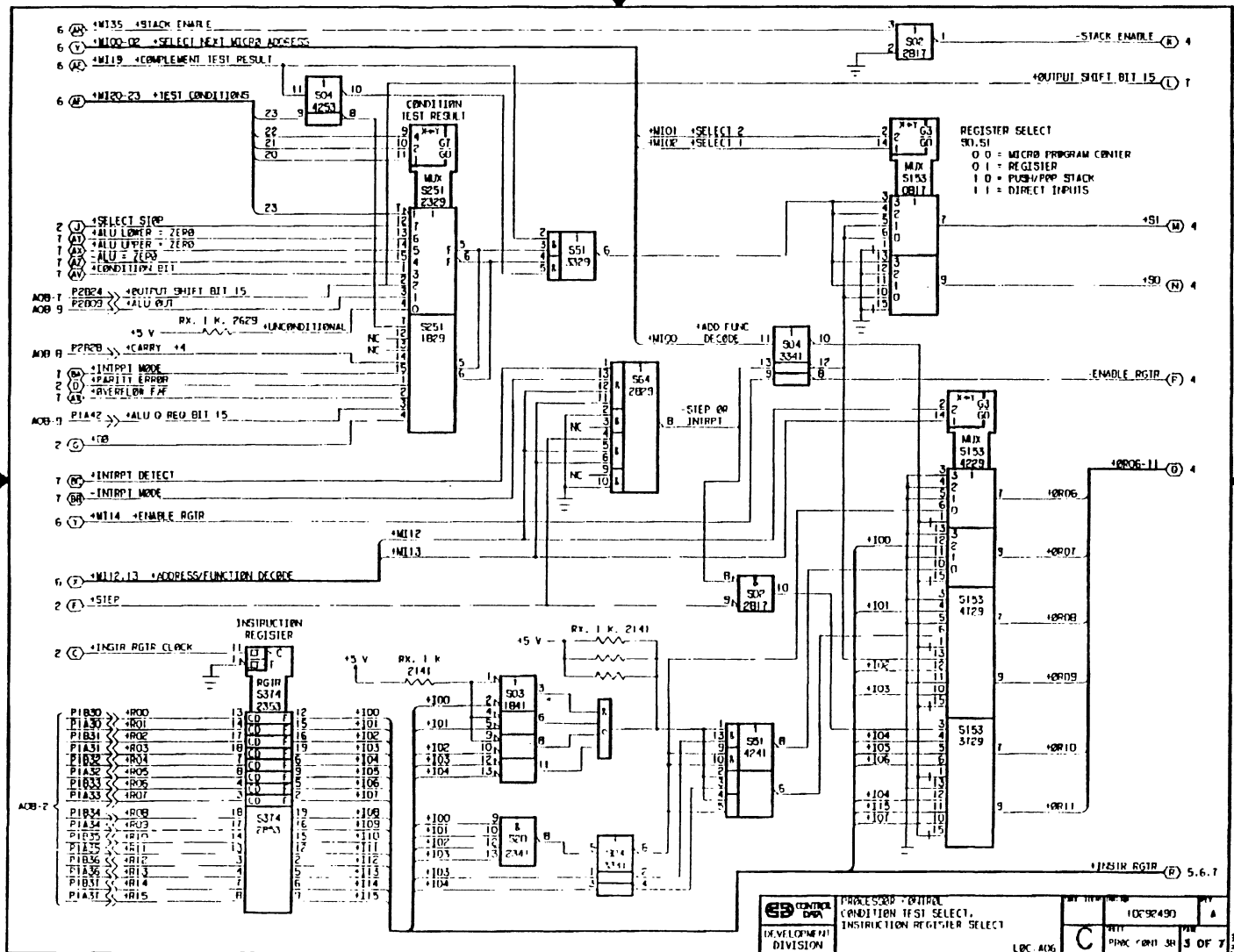


Processor Control Logic Diagram - A06

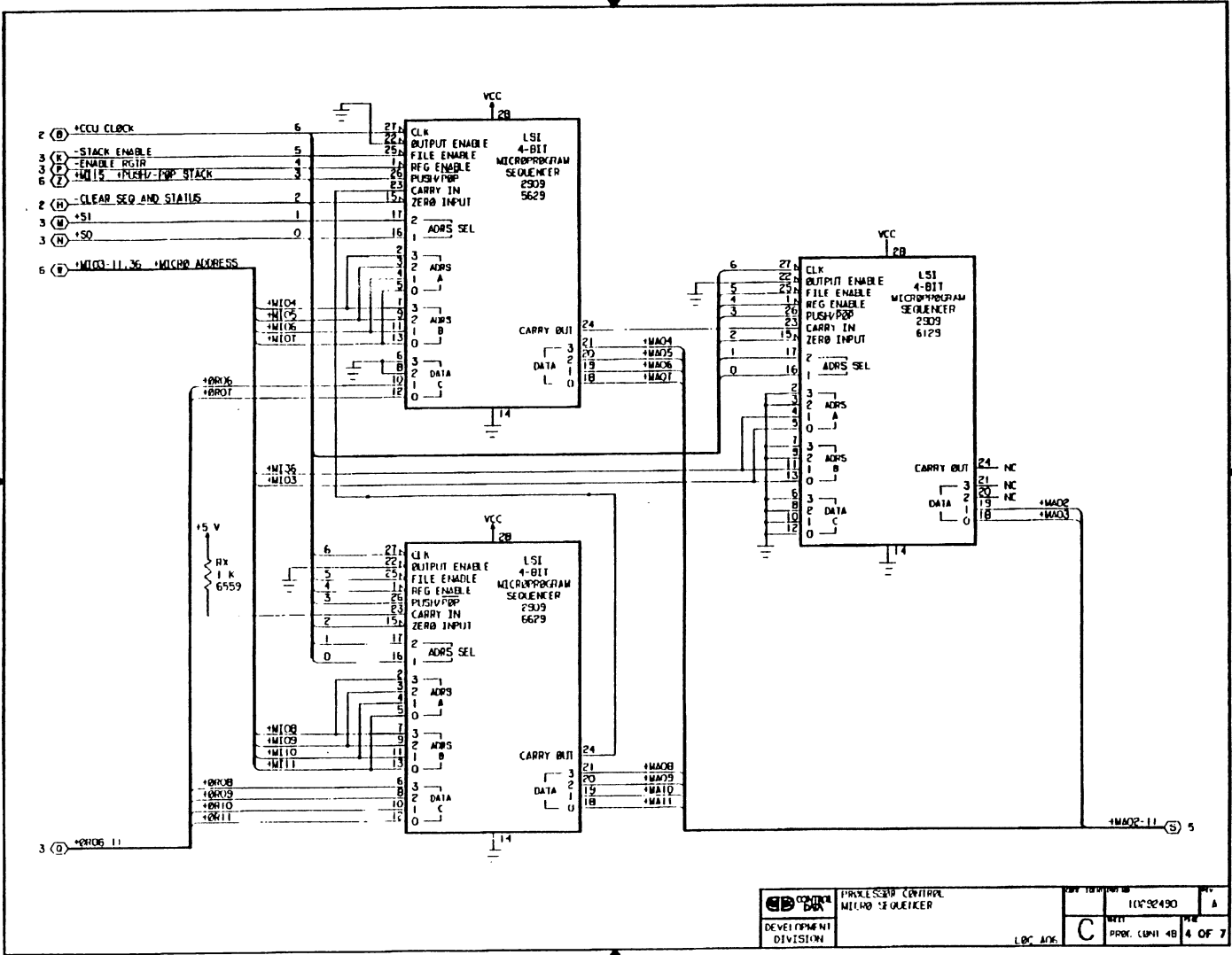
The processor control logic processes all instructions of processor ALU (A05). For details of operation, including the internal instruction set of the processor, refer to appendix B of the CYBER Channel Coupler 19404-1/2/3/10/11/12 Hardware Reference Manual listed under Related Manuals in About This Manual.

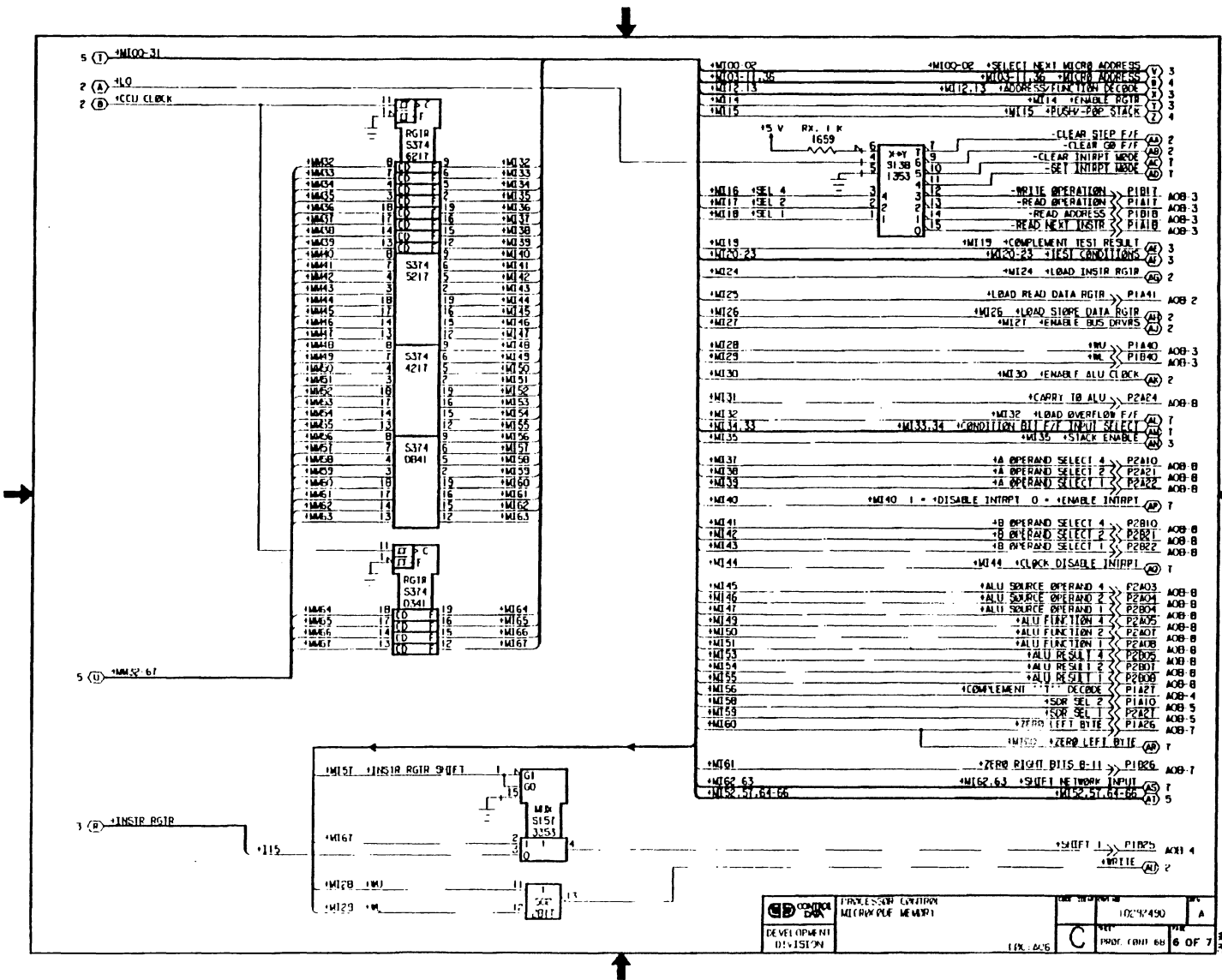
The revision level for each sheet for the processor control logic diagrams (location A06) are listed on the logic diagram cover sheet (the following page).

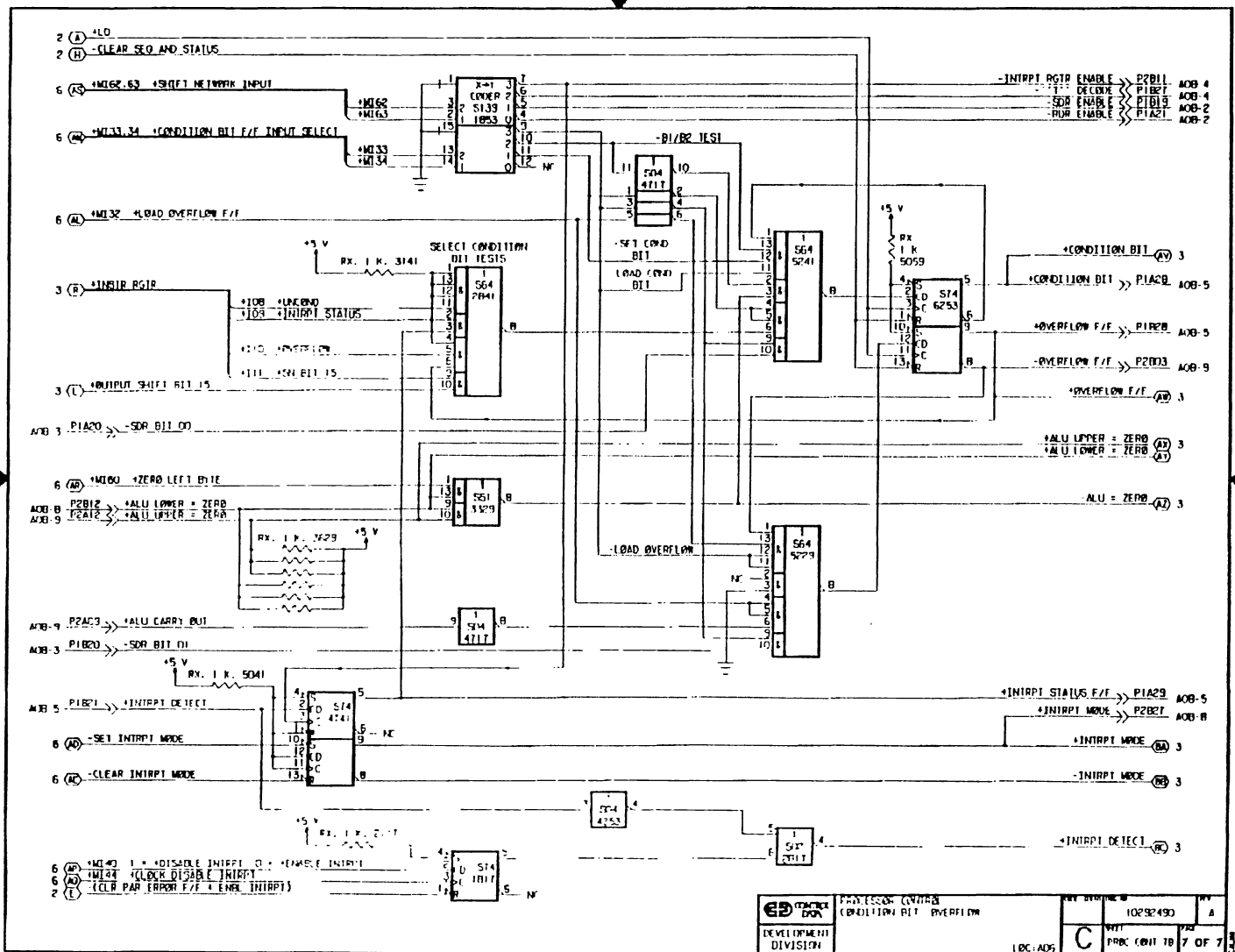




PROCESSOR CONTROL CONDITION TEST SELECT INSTRUCTION REGISTER SELECT	1009490	1
DEVELOPMENT DIVISION	PHC 0011 SH	5 OF 7








Memory 65K PROM Logic Diagram - A07

The Memory 65K PROM revision level for each sheet of the RAM_ROM logic diagrams (location A07) are listed on the logic diagram cover sheet (the following page).

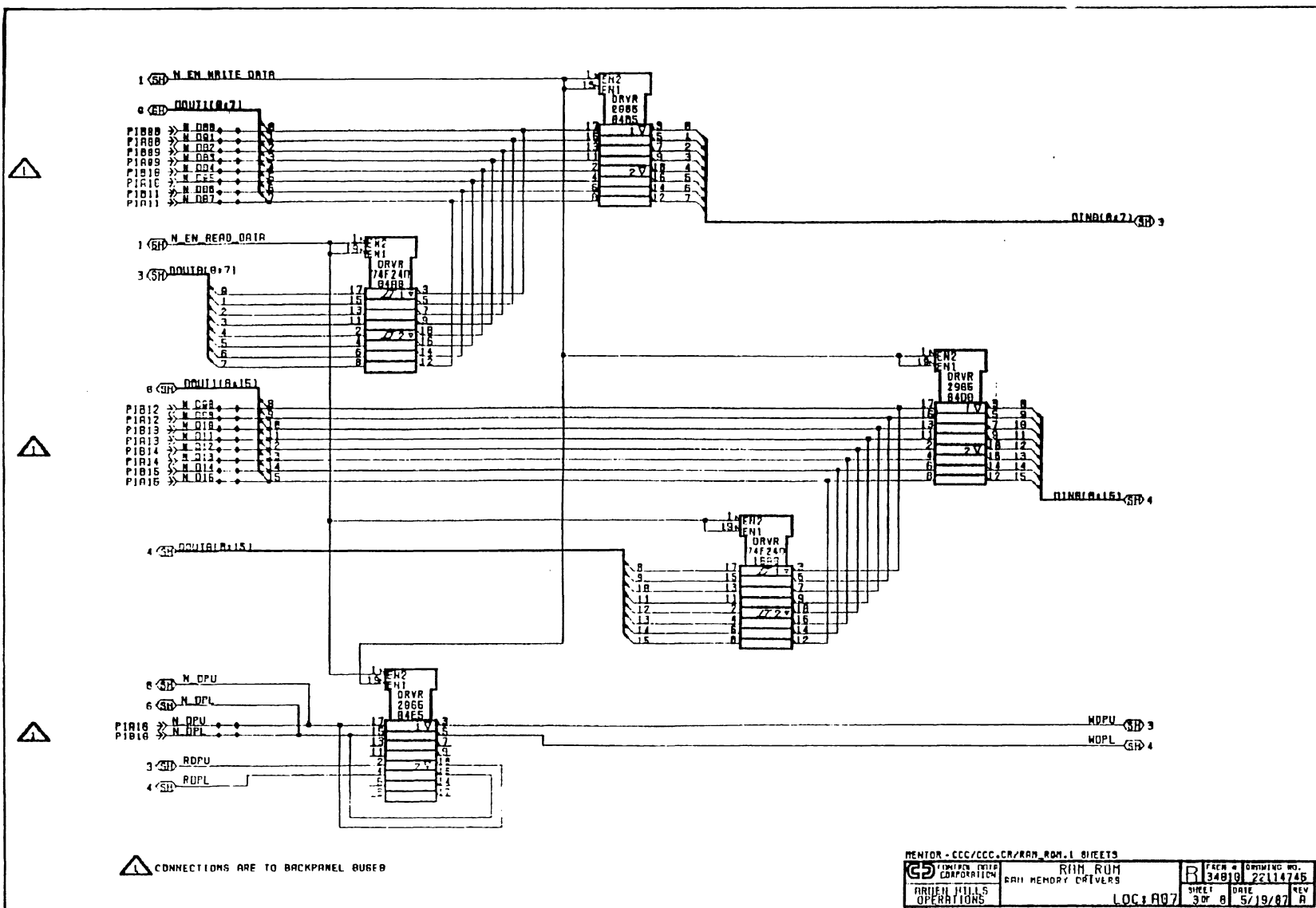
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B	A	A	A	A	A	A	C	CA 49315 A	ADD PWA/PWB # TO TITLE BLK	GRH	4/22/88	GRH	GRH

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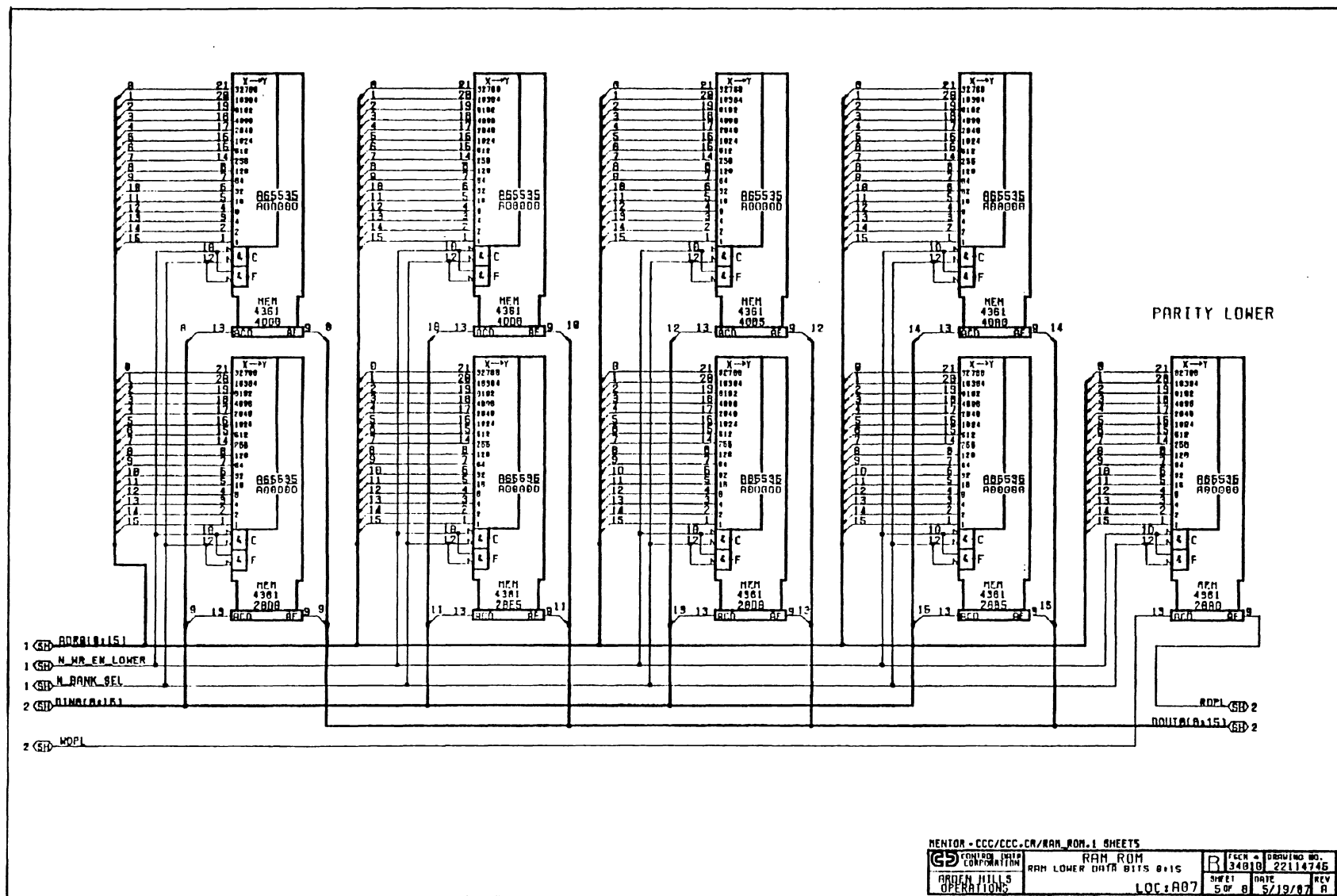
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CHKD	G R HOOD	5/19/87	
ENGR	G R HOOD	5/19/87	
APVD	L S BLFIC	5/19/87	
EQUIP. NO. FR205-B			

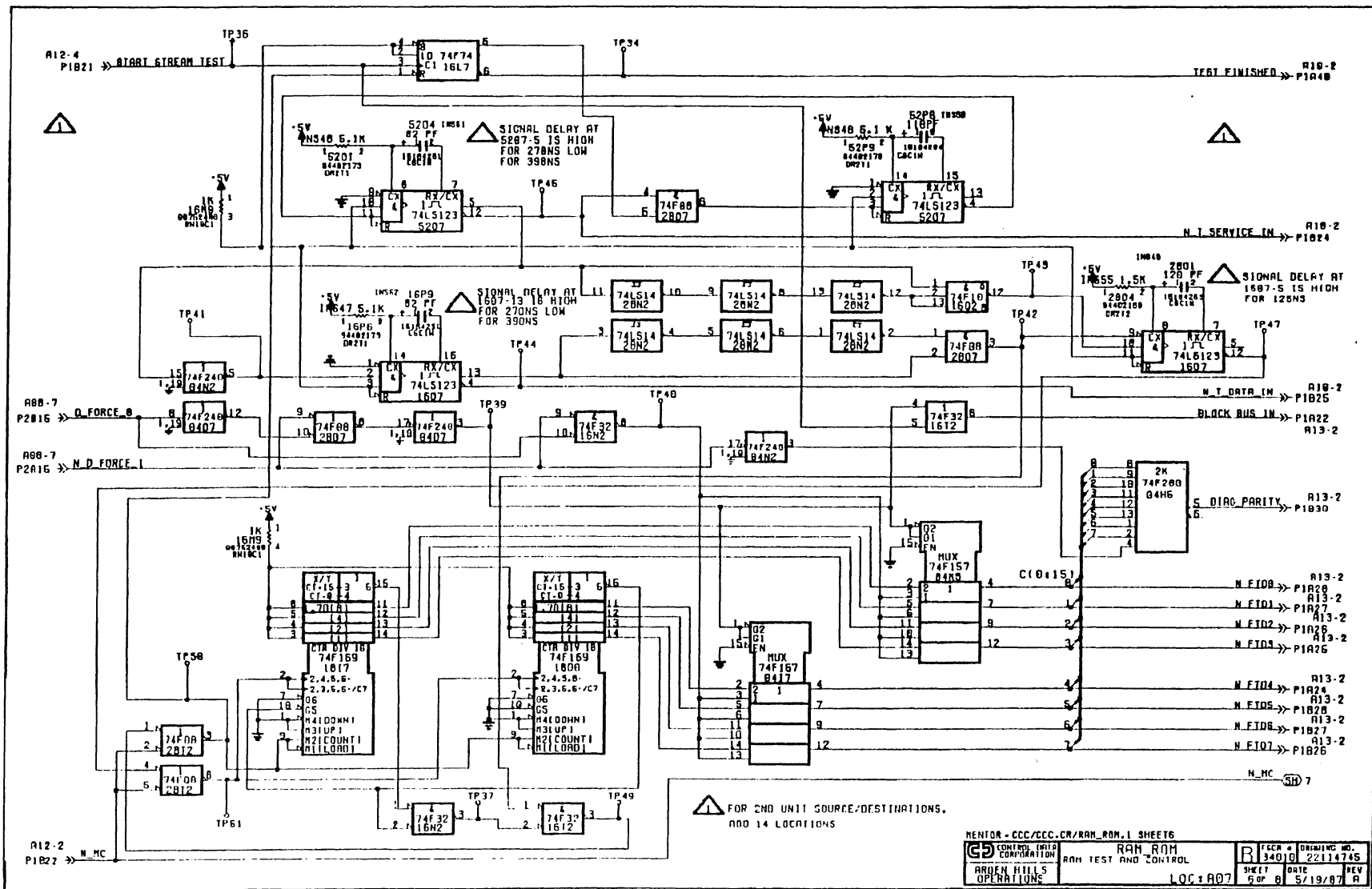
CONTROL DATA CORPORATION HARDEN HILLS OPERATIONS		MEMORY 65K PROM AND TEST LOGIC LOC: R07		PSEA # DRAWING NO. 34010 22114745 SHEET DATE REV 1W 8 8/20/87 8	
-----------------------------------------------------	--	-----------------------------------------------	--	--------------------------------------------------------------------------	--

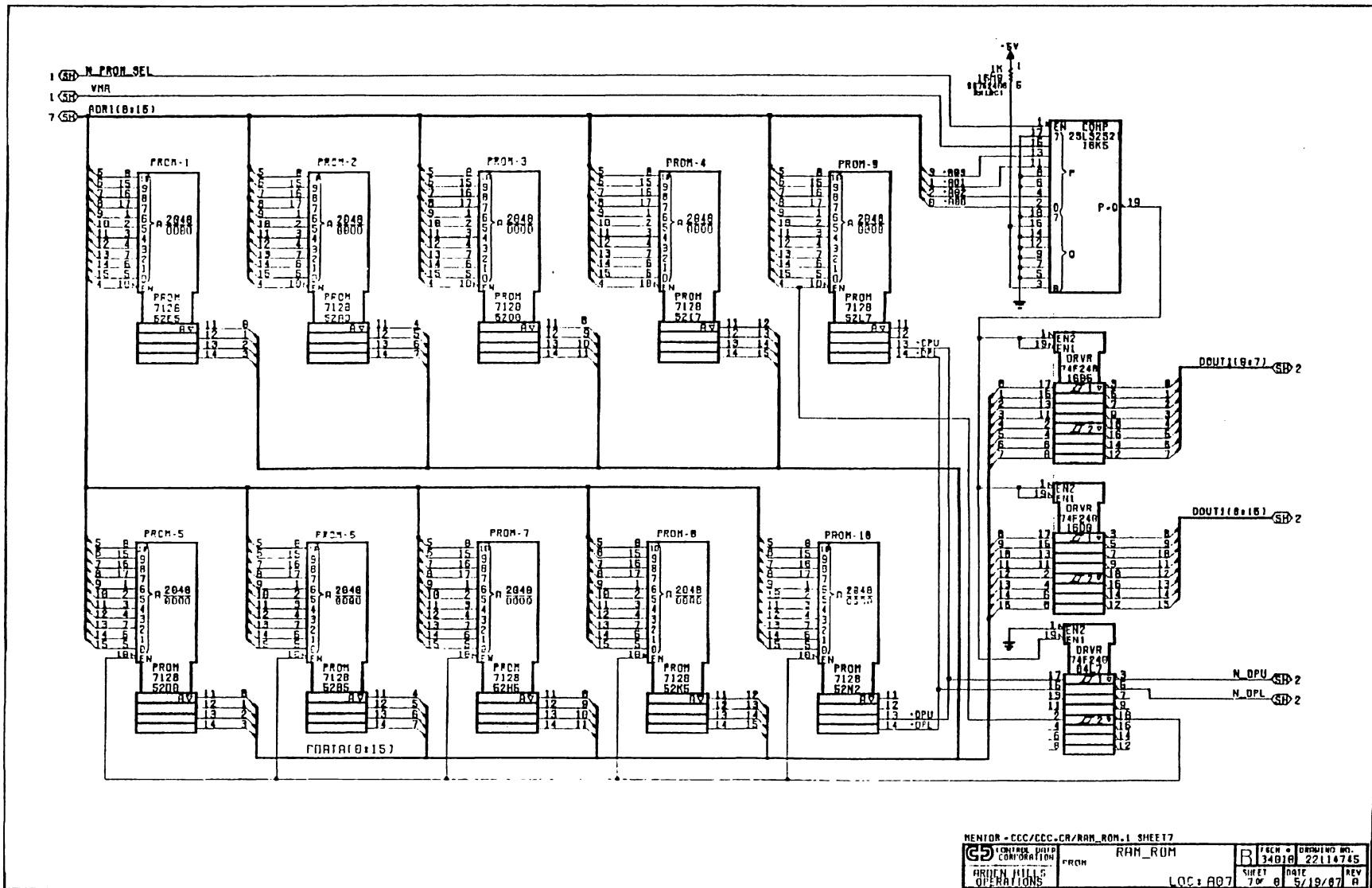






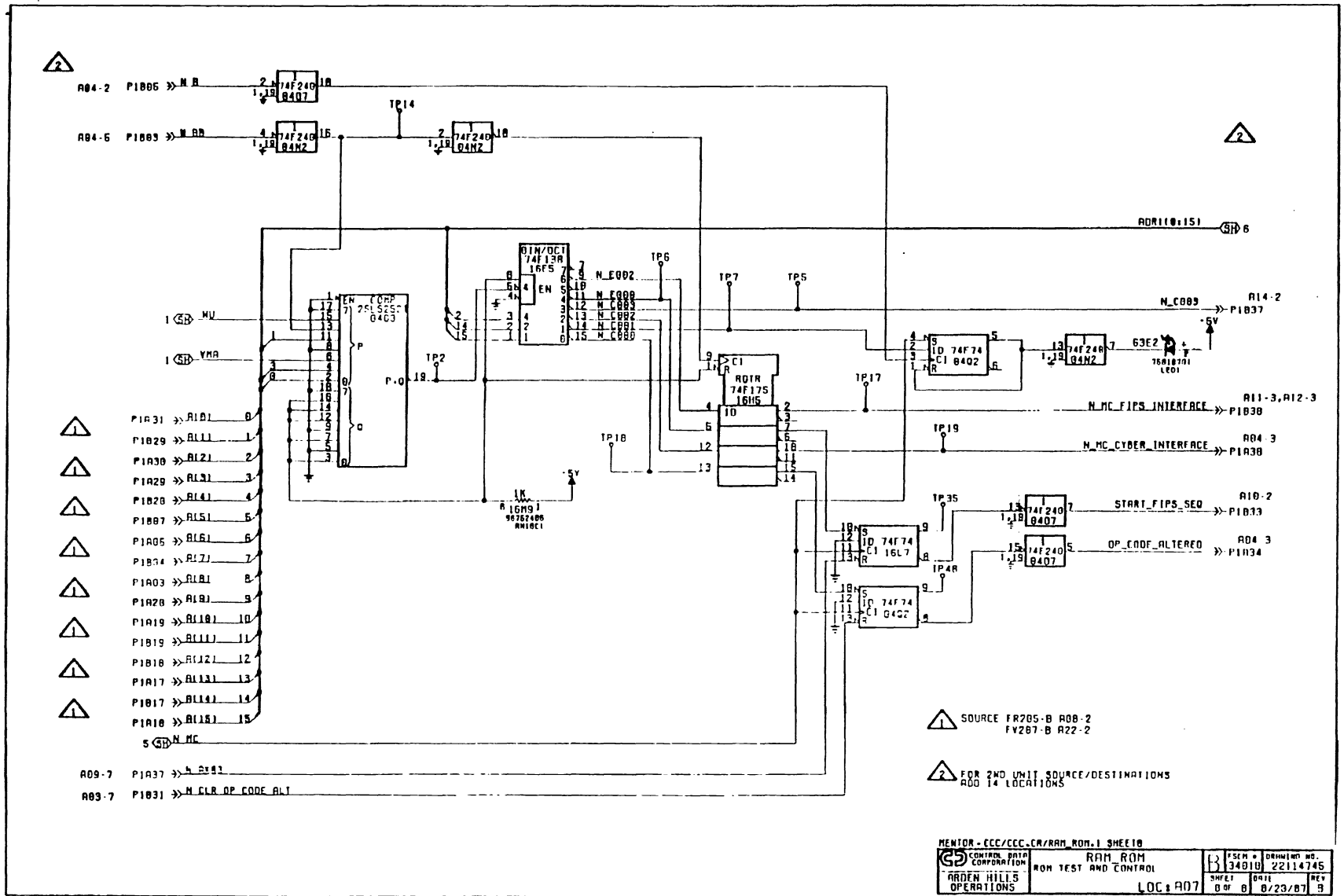






MEMOR - CCC/CCC.CA/RAM_ROM.1 SHEET 7		FROM RAM_ROM		B FROM 34010 22114745	
DATE	5/19/87	REV	A	DATE	5/19/87
OPERATIONS		LOC: A07			



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Transfer Logic Diagram - A08

The revision level for each sheet of the transfer logic diagrams (location A08) are listed on the logic diagram cover sheet (the following page).

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SHEET IN THE TITLE BLOCK AREA ON DIAGRAMS.

DETACHED LISTS	SWW	C. WITZKE	11/30/89	<div> <div>  </div> <div> CONTROL DATA CORPORATION ST. PAUL, MINN. </div> </div>	<div> <div>ARDEN HILLS OPERATIONS</div> <div>ST. PAUL, MINN.</div> </div>
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	ENG	C. WITZKE	11/30/89		
	N:G				
	APTD	D. WITZKE	11/30/89		
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				SHEET	TITLE-1
					PAGE 1 OF 8

Transfer Address - A08-2

The following paragraphs describe the function of the components shown on the following page.

General

The transfer logic provides the necessary circuits to transfer data from the CYBER channel interface through memory to the FIPS device, and vice versa, without requiring use of either interface UDI. The processor sets up the transfer operation by initiating a FIPS-device-interface-control sequence to load the transfer registers. The processor then places the CYBER channel interface and/or the FIPS device interface in transfer mode. During the transfer, data is written into a circular buffer by one interface and read from that buffer by the other interface. When an interface is in transfer mode, the interface-memory slot time is used by the transfer logic and the interface UDI is unable to reference memory. The UDI regains its memory slot time when the transfer is completed or when a Master Clear signal is received.

Address-Bus Receivers

During a PROM operation, the 16-bit address (bits 00 through 15) is sent from the address bus to the receivers on the bidirectional circuit pins. The address is then sent from the receivers to the PROM (A07-8).

Address-Bus Drivers

During a DMA-write/read operation, the address (bits C00 through C15) from the CCC address register/counter or CYBER address register/counter (A08-3) is sent from the drivers to the address bus on the same bidirectional circuit pins used by the address-bus receivers.



Transfer A/D Bus and Address Registers – A08-3

The following paragraphs describe the function of the components shown on the following page.

Address Register

A 16-bit address (bits AD00 through AD15) is loaded onto the address bus by the FIPS interface UDI (A09) and sent to the address register of the transfer logic before a data transfer starts. The address register routes the address (bits B00 through B15) to the FIPS address counter and, also, the CYBER address counter.

FIPS Address Counter

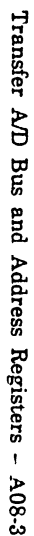
The FIPS address counter provides addresses for data transfers during the memory access time (slot time) of the FIPS interface. The FIPS interface UDI (A09) is disabled at this time. Bits 00 through 02 are held in the address register and do not change during a data transfer. Bits 03 through 15 are held in the FIPS address counter. The counter increments the address each time the FIPS interface reads a word from memory (A07) or writes a word into memory. The counter has a range from 0 to 511 and wraps around to provide a 512-location circular buffer in memory. Bits 00 through 02 form the upper three bits of the address used in the circular buffer.

CYBER Address Counter

The CYBER address counter provides the addresses for data transfers during the memory slot time of the CYBER interface. The address register is the same as that used for the FIPS address counter. The CYBER address counter increments the address each time the CYBER interface reads or writes a memory word. Operation of this counter is identical to that described for the FIPS address counter.

FIPS/CYBER Multiplexer

The 0C clock determines the memory slot time for the CYBER interface and gates the CYBER address bits (V00 through V02 and X03 through X15) through the multiplexer. When the 0C clock is at a logical 0 level (0C clock not present), the FIPS address bits (V00 through V02 and W03 through W15) are gated through the multiplexer. The multiplexer output bits (C00 through C15) are sent to the address-bus drivers (A08-2).



Transfer Full/Empty Counter and Minimum Block Length - A08-4

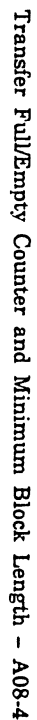
The following paragraphs describe the function of the components shown on the following page.

Buffer Full/Empty Counter

This is a 14-bit counter that increments when a data word is written into the 8K location circular buffer in memory (A07). It decrements when a data word is read from the buffer. The output of the counter is decoded to provide either a Buffer Full (8192_{10} or 2000_{16} count) or Buffer Empty (0 count) signal to the CYBER interface and FIPS-interface-data-control circuits. Data cannot be written into memory during a buffer-full condition or read from memory during a buffer-empty condition. This counter is loaded by the processor via the FIPS device interface.

Minimum Block Length (MBL) Register

This is a 14-bit register that contains the value of the minimum number of words required in a block of data. The output of the MBL register is compared to the output of the buffer full/empty counter during a read operation. A Buffer Empty signal is sent to the CYBER interface (A02-4) until the buffer full/empty counter reaches a value equal to that set in the MBL counter. This prohibits data blocks shorter than the required minimum block length from being transferred to the CYBER interface. The contents of the MBL register is not used during a write operation. This register is loaded by the processor via the FIPS device interface.



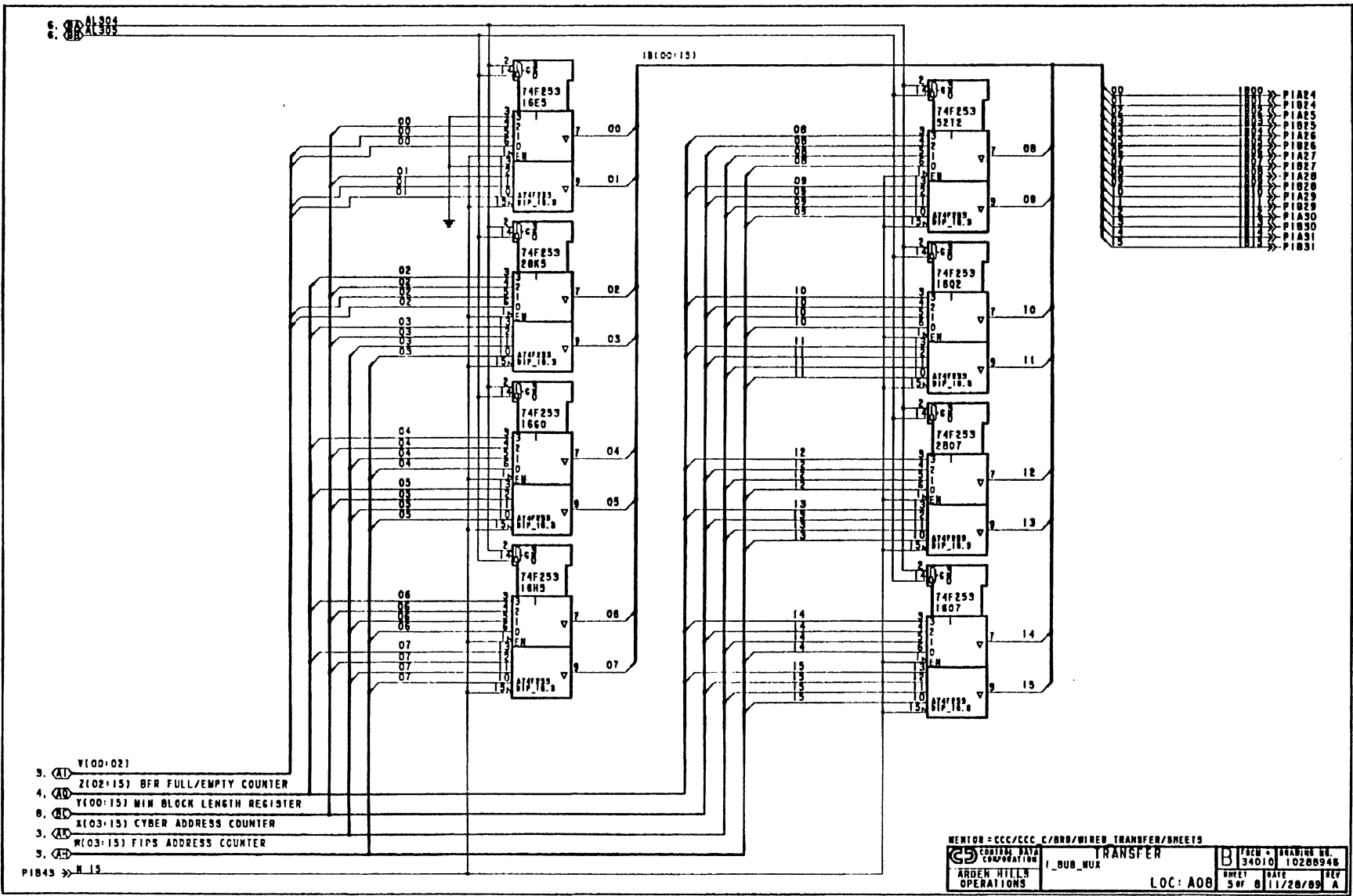
Transfer I Bus Multiplexer - A08-5

The following paragraphs describe the function of the components shown on the following page.

I Bus Mux

Addressable latch bits AL304 and AL305 are decoded to provide enables to the multiplexers. The following information is gated to the I bus for the various combinations of the enable bits.

AL304	AL305	I-Bus Information
0	0	FIPS address (bits W03 through W15 and V00 through V02)
0	1	CYBER address (bits W03 through W15 and V00 through V02)
1	0	Minimum block length (bits Y00 through Y15)
1	1	Buffer full/empty count (bits Z02 through Z15, also note that mux bits IB00 and IB01 become zeros because of the grounded inputs at U34 pins 3 and 13)



Transfer Addressable Latch - A08-6

The following paragraphs describe the function of the components shown on the following page.

Addressable Latch Register

The outputs of the addressable-latch register are selected by microcode bits CP17 and CP21 through CP23 from the FIPS interface UDI (A09-2). Register outputs AL304, AL305, AL306, and AL307 are used to gate information through the I-bus multiplexers (A08-5 and A13-2) to the I bus. The write-operation-output signal of the register functions as a direction latch that is used to indicate either a read or write operation. When cleared, a read operation is performed and data flow is from the FIPS device interface to the CYBER channel interface. When set, a write operation is performed and data flow is from the CYBER channel interface to the FIPS device interface.



Transfer Addressable Latch - A08-7

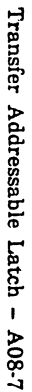
The following paragraphs describe the function of the components shown on the following page.

Addressable Latch Register

The outputs of the addressable-latch register are selected by microcode bits CP21 through CP23 from the FIPS interface UDI (A09-2).

Register outputs are used to control diagnostic functions and enable loading code tables.

The Transfer Mux Select 2 signal is used to enable the byte-counter (A08-8) output into the I-bus multiplexer (A08-5).



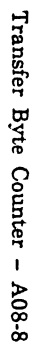
Transfer Byte Counter - A08-8

The following paragraphs describe the function of the components shown on the following page.

Byte Counter

The byte counter is a 16-bit counter that may be used to terminate a FIPS data transfer without waiting for the FIPS device to send a Status-In signal (A10-2). The counter is loaded with one less than the number of bytes that is to be transferred. During a write operation, the count is decremented by one count each time a byte is accepted by the FIPS device. During a read operation, the count is decremented by one count each time a byte is received from the FIPS device and written into coupler memory (A07).

The byte-counter output is sent to a multiplexer. The multiplexer gates either the byte-counter bits or the MBL counter (A08-4) bits to the I-bus multiplexer (A08-5). The Byte Count = 0 signal is sent to the control-flag register of the stream logic (A10-2).



FIPS 2K UDI Logic Diagram – A09

The revision level for each sheet of the FIPS 2K UDI logic diagrams (A09) are listed on the logic diagram cover sheet (the following page).

PAGE										REVISION RECORD				
9	8	7	6	5	4	3	2	1	EDP	DESCRIPTION	REV	DATE	CHKD	APPRO
A	A	A	A	A	A	A	A	A	CA4809T	CLASS & RELEASED	MS	10/19/80	MS	TAS
B	B	B	B	B	B	B	B	B	CA48039	ADDED COVER, RE. INTERSHEET	MS	10/19/80	MS	TAS
B	B	B	B	B	B	B	B	C	CA48080	NEW PWA NUMBER	MS	11/11/80	MS	NE
B	B	B	B	B	B	B	B	D	CA49315	NEW PWA NUMBER	MS	11/11/80	MS	NE

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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES		OWN	M E SKIMMINT	REV/EC
TOLERANCES		ORD	N SAMFISON	REV/EC
F. PLAT		IMP	R T HENNING	REV/EC
F. PLAT		WPS	B J REILLARD	REV/EC
MATERIAL		MPD	R T HENNING	REV/EC
FINISH		<div style="text-align: center;"> </div>		

FR205-B

ITEM NO

34010

CONTRACT DATA

ARMED FORCES OPERATIONS

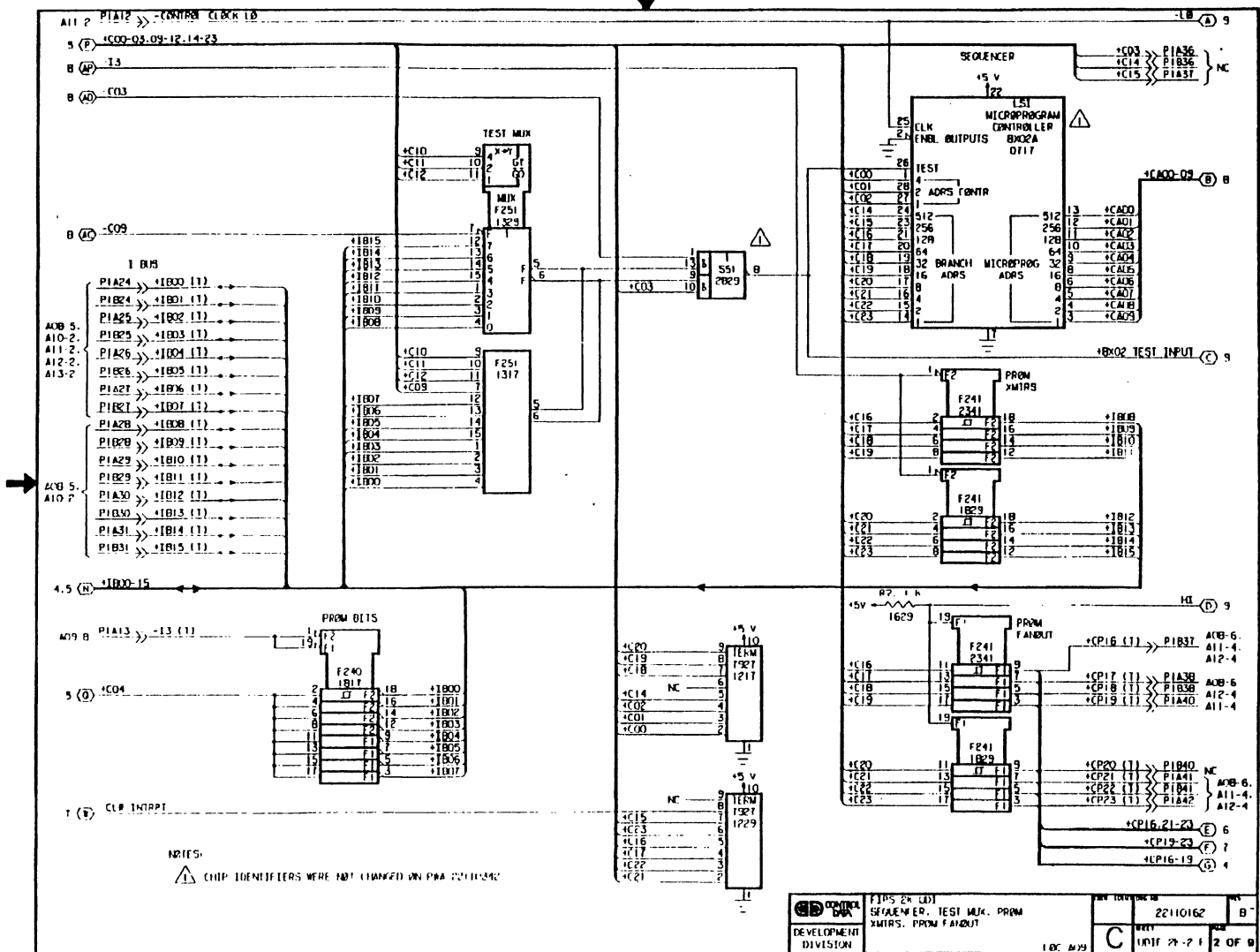
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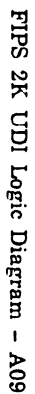
LOGIC DIAGRAM

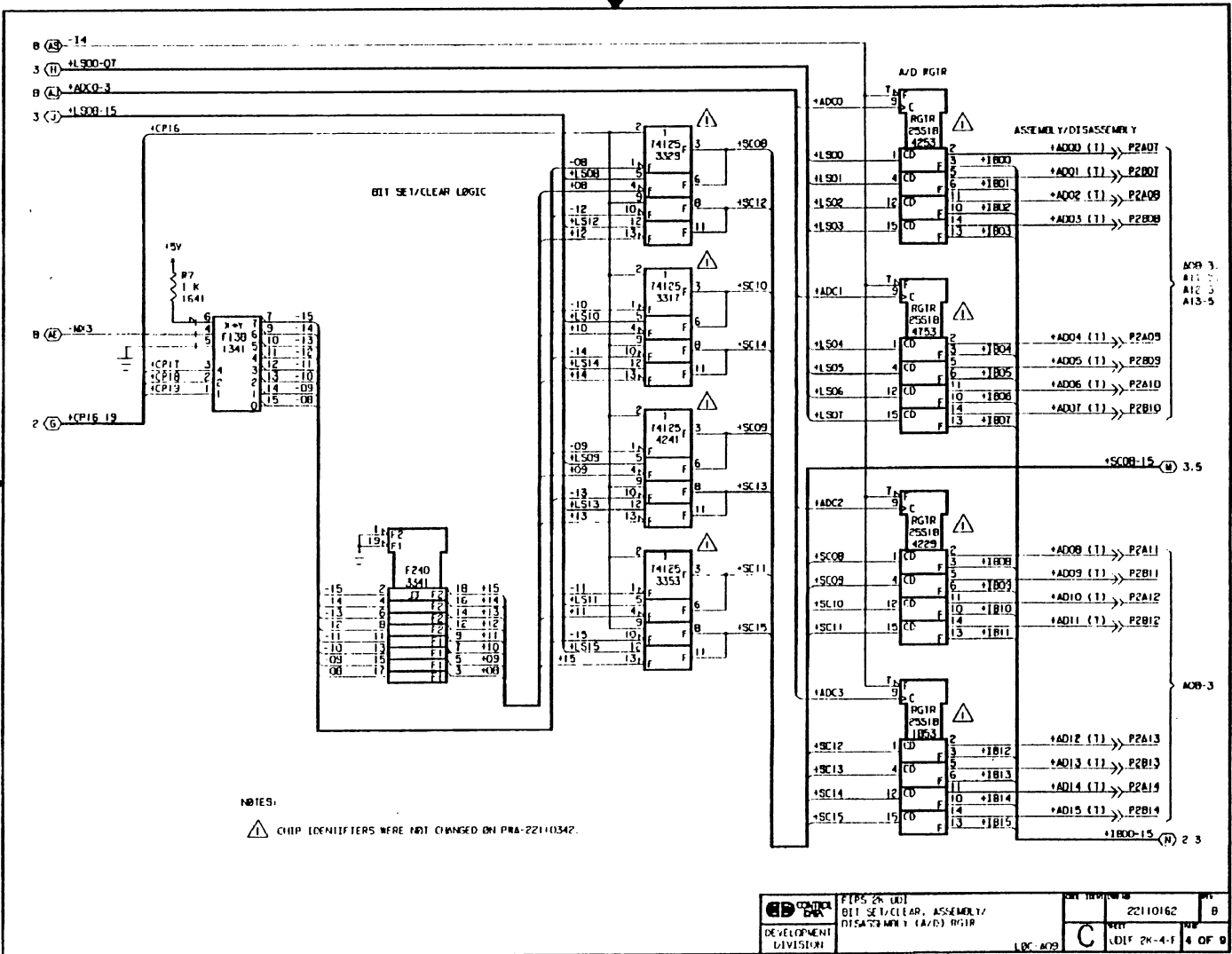
FIPS 2K UOI

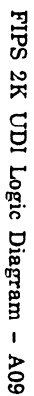
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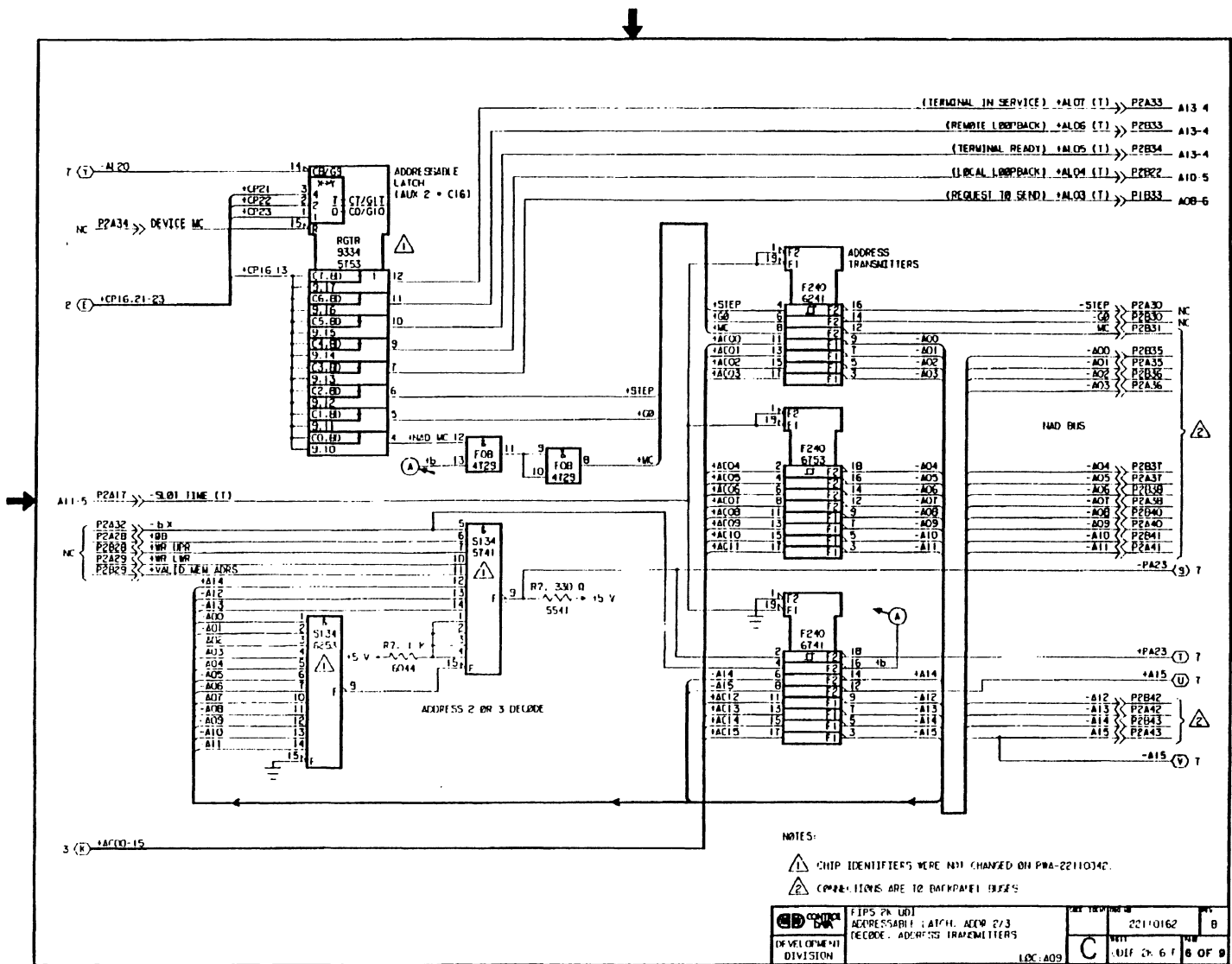
PAGE 1 OF 9

















Stream Logic Diagram - A10

The revision level for each sheet of the stream logic diagrams (location A10) are listed on the logic diagram cover sheet (the following page).

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DWN	D. WITZKE	6/4/91	 CONTROL DATA CORPORATION	ARDEN HILLS OPERATIONS	
CHKD	D. WITZKE	6/4/91		ST. PAUL, MINN.	
ENGR	D. WITZKE	6/4/91		TITLE	
MF0	T. SPEIDEL	6/4/91		STREAM	
RPVD	D. WITZKE	6/4/91			
EQUIP. NO.			 B	FSC#	DWO NO.
19404-10				34010	10283559
			SHEET	TITLE-1	PAGE 1 OF 7

DETACHED LISTS

19404-10

THE	FSCN #
B	34010
	SHEET

DWO NO.	10283559
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SHEET	TITLE	PAGE	REV	DATE
1	1	1	1	1

Stream Logic - A10-2

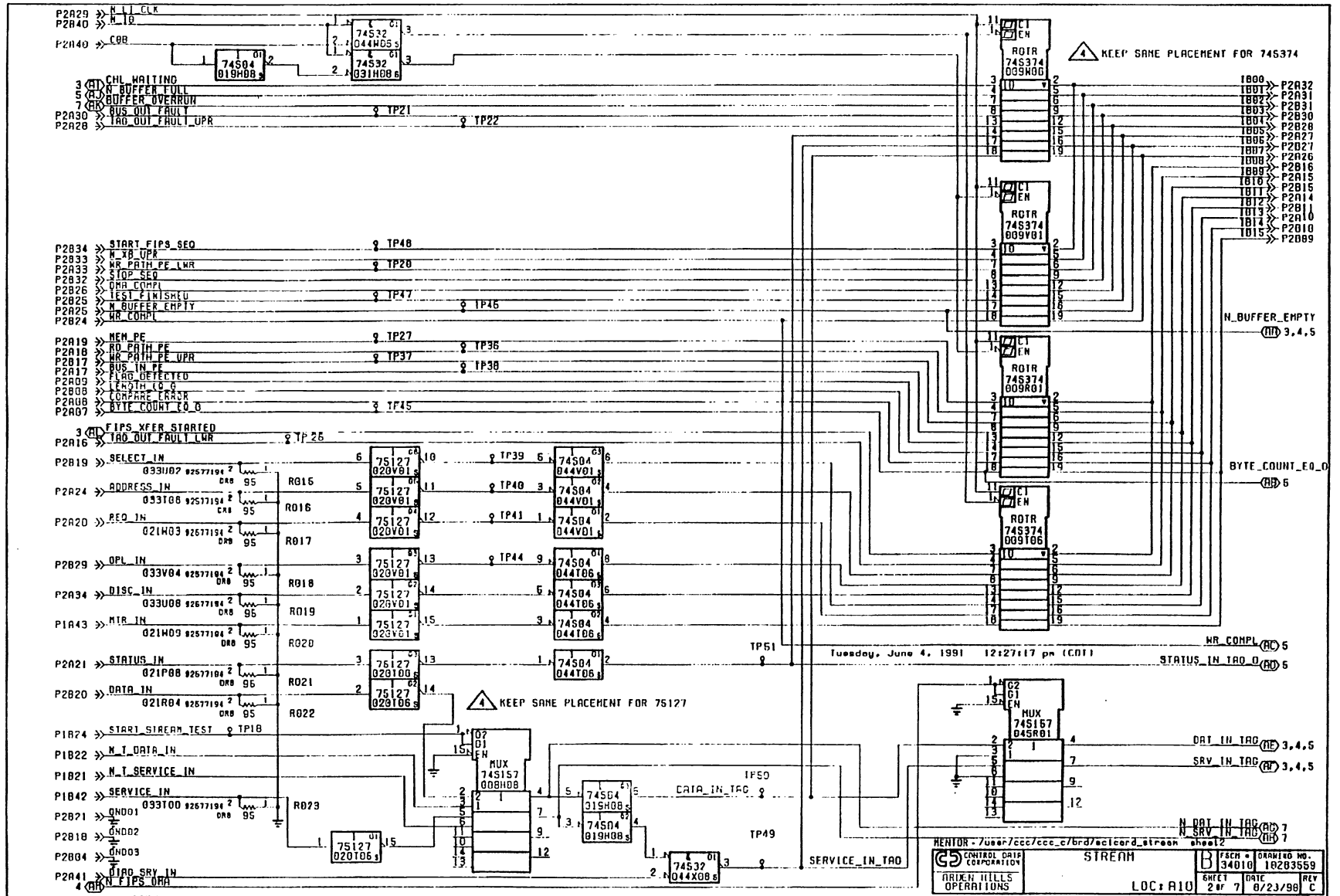
The following paragraphs describe the function of the components shown on the following page.

Control-Flag Registers

Various status and control signals and tag lines are clocked into control-flag registers 0 and 1 by the L1 Clk signal from the data bus. When bit C08 from the UDI (A09-8) is set, control-flag register 1 is enabled. If this bit is not set, control-flag register 0 is enabled. The control-flag register signals are sent to the I bus.

Tag-Line Circuits

These circuits receive signals on the tag lines from the external FIPS device. The tag lines control information on the bus-in lines (A13-2).



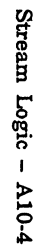
Stream Logic - A10-3

The CCC stream logic diagram (location A10-3) is shown on the following page.



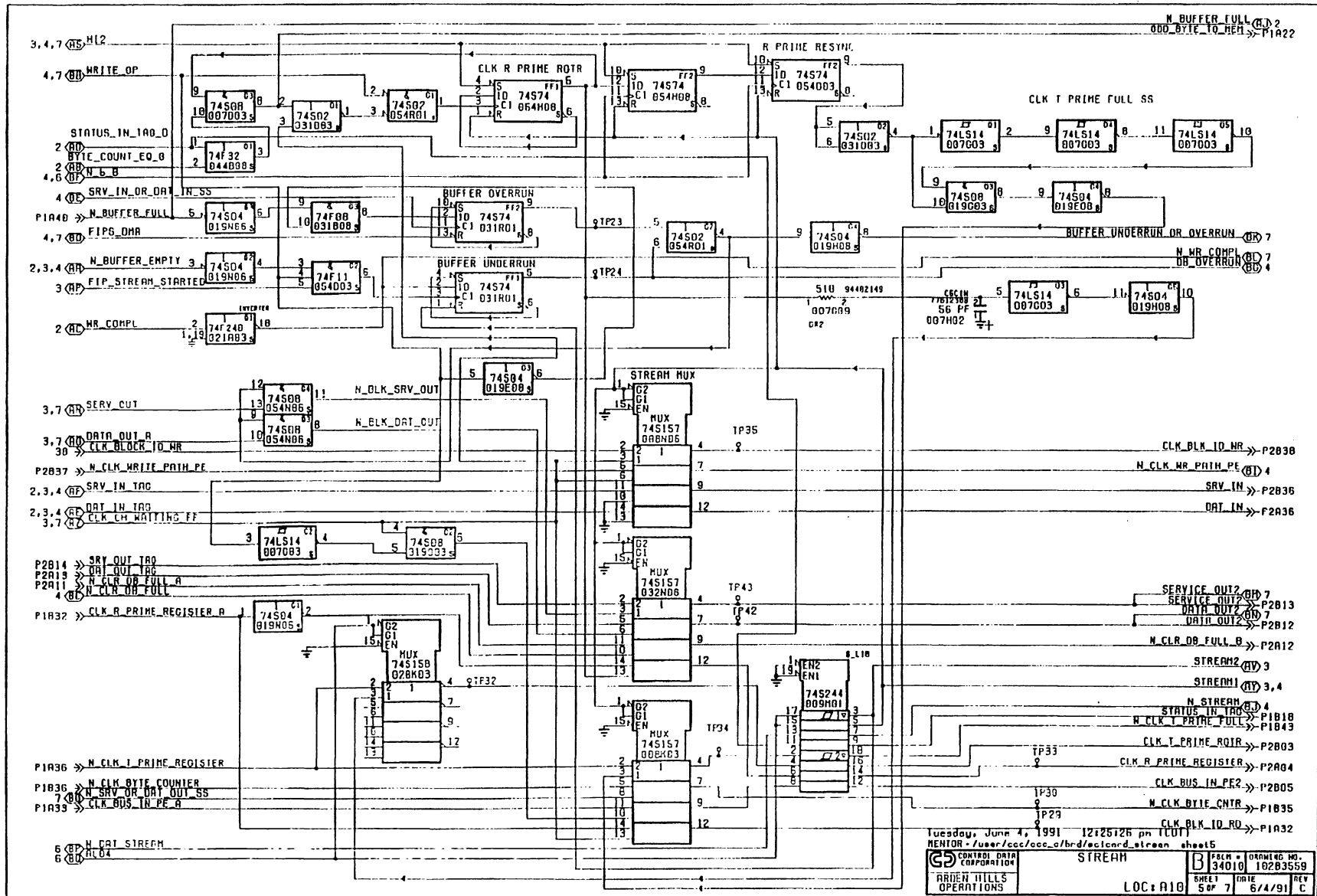
Stream Logic - A10-4

The CCC stream logic diagram (location A10-4) is shown on the following page.



Stream Logic – A10-5

The CCC stream logic diagram (location A10-5) is shown on the following page.



Stream Logic - A10-6

The CCC stream logic diagram (location A10-6) is shown on the following page.



Stream Logic - A10-7

The CCC stream logic diagram (location A10-7) is shown on the following page.



FIPS Interface-II - A11

The revision levels for each sheet of the FIPS Interface-II logic diagrams (location A11) are listed on the logic diagram cover sheet (the following page).

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FIPS Interface-II - A11

FIPS Interface-II - A11-2

The following paragraphs describe the function of the components shown on the following page.

Data-Bus Drivers

During a coupler-read operation, the upper 8-bit byte (bits T1 through T8) from the T register (A11-5) is transferred from the drivers to the data bus on the bidirectional data lines. The 8-bit byte is then written into memory (A07-3).

Data-Bus Receivers

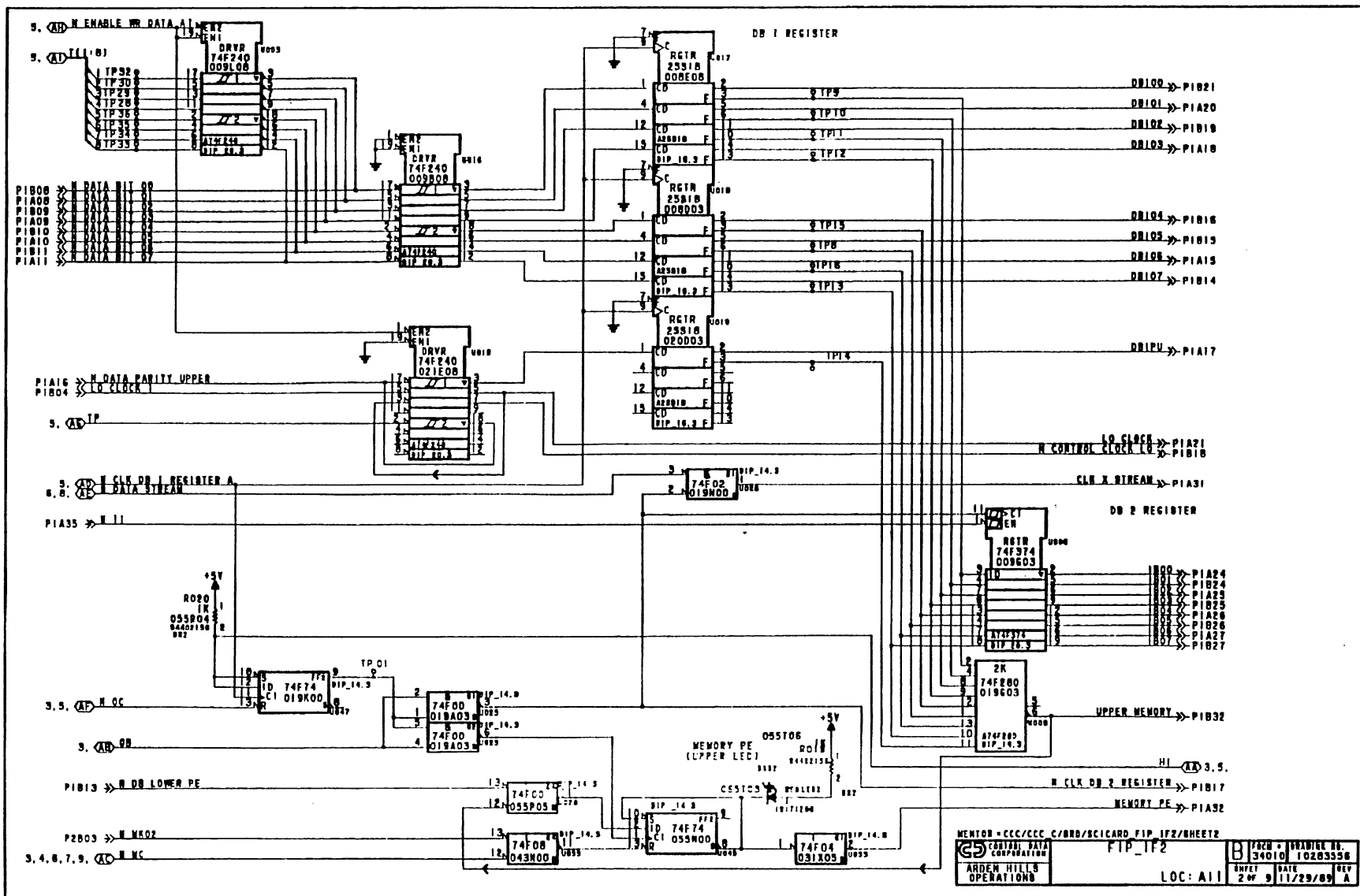
During a coupler-write operation, the upper 8-bit byte (bits 00 through 07) is transferred from the data bus to the receivers on the same bidirectional lines used by the data-bus drivers. The data-bus receivers then send the 8-bit byte to the DB1 register.

Data-Bus Registers (DB1, DB2)

The upper data-bus byte from the data-bus receivers is clocked into the DB1 register by the Clk DB1 Register signal from the memory control circuit (A11-5). This signal is also used to generate the Clk DB2 Register signal (A11-2) that clocks the upper data byte from the DB1 register to the multiplexer (A13-4) and into the DB2 register to the I bus as bits IB00 through IB07.

Data-Bus Parity Check Circuit

This circuit performs an odd-parity check of the upper data-bus byte and associated parity bit. The memory-parity-error LED indicator is not used.

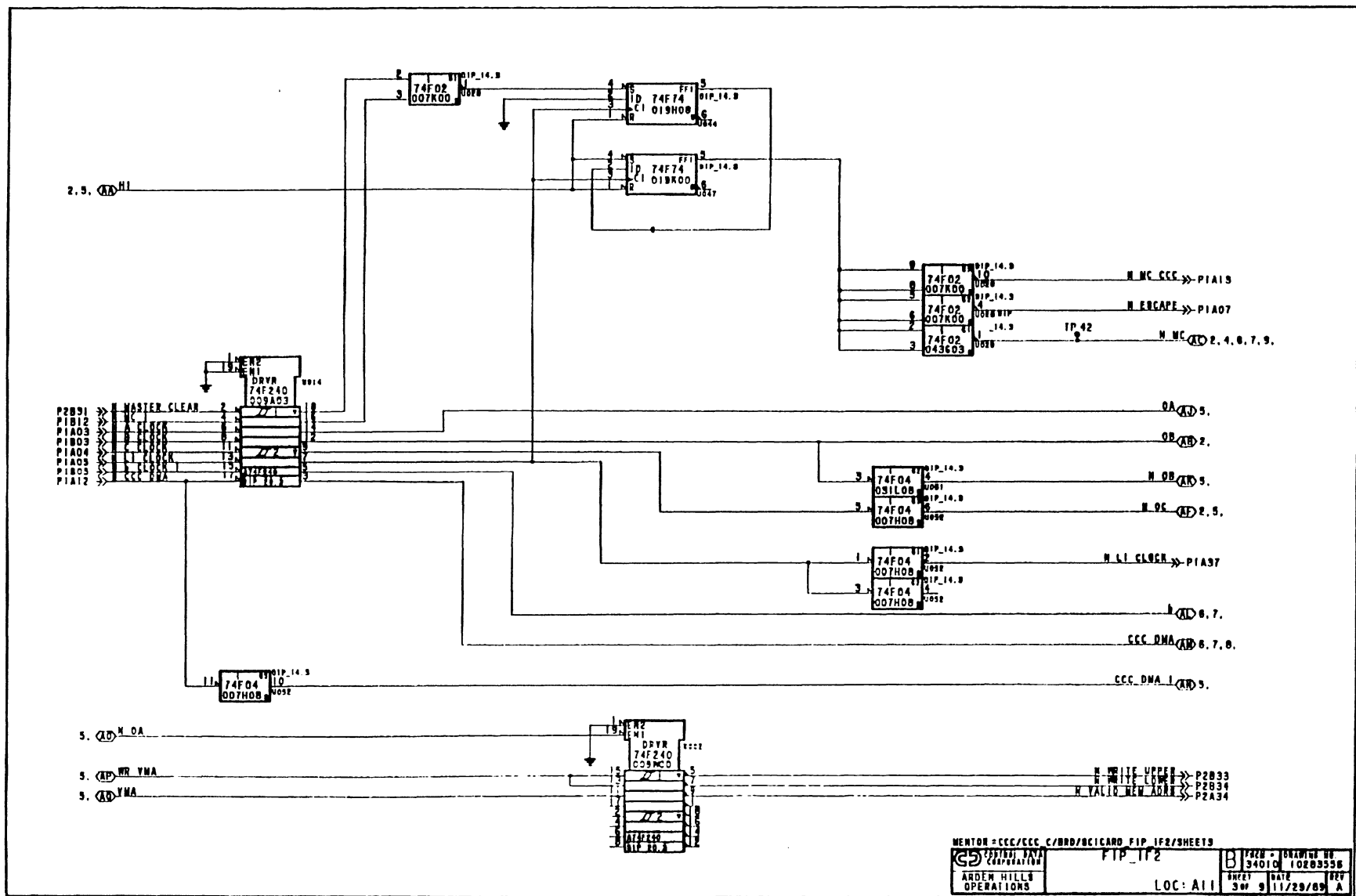


FIPS Interface-II - A11-3

The following paragraphs describe the function of the components shown on the following page.

Data-Bus Receivers/Drivers

Various clocks and signals, including data-bus, access-time clocks for the FIPS interface, processor, and CYBER interface (A, B, and C clocks) and master clear are received from the data bus or transmitted to the data bus via the data-bus receivers/drivers.



FIPS Interface-II - A11-4

The following paragraphs describe the function of the components shown on the following page.

Addressable-Latch Register

The outputs of the addressable-latch register are selected by microcode bits CP19, and CP21 through CP23 from the FIPS-interface UDI sequencer (A09-2). The register outputs are sent via the multiplexer circuits to the tag transmitters. The associated LED indicator (CR2) is not used and remains unlit.

Tag Transmitters

These circuits transmit signals on the tag lines to the external FIPS device. The tag lines control the information that is present on the bus-out lines (A13-5).



FIPS Interface-II - A11-5

The following paragraphs describe the function of the components shown on the following page.

T Register

The upper 8-bit byte of assembly/disassembly information (bits AD00 through AD07) is clocked into the T register during a UDI-read operation. The read data bits (T1 through T8) in the T register are then sent to the data-bus drivers (A11-2) and the parity generator.

T' Register

The upper 8-bit byte of data-bus information (data-in bits 00 through 07) is clocked into the T' (T Prime) register during a DMA-read operation. The read data bits (T1 through T8) are sent to the parity generator (A11-5) and the data-bus drivers (A11-2).

Parity Generation

A parity bit is generated on the data from the T or T' register. This parity bit (TP) is sent to the data-bus driver (A11-2) along with the read data bits (T1 through T8). The parity generator also sends a parity bit to the parity-check circuit (A11-5).

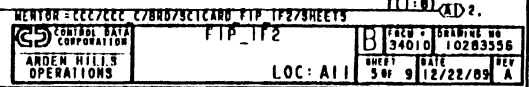
Parity-Check Circuit

This circuit compares the DMA-read-data-parity bit (data-in PU) with the parity bit generated from the DMA-read data after it passes through the T' register. A Read Path PE signal is sent to the control-flag register (A10-2) if an error occurs in transmission of DMA-read data.

Memory Control

The T full and write valid memory address (VMA) FFs provide the timing signals necessary to write data into memory (A07).

The data bus (DB) full and read VMA FFs provide the timing signals necessary to read data from memory (A07).



FIPS Interface-II - A11-6

The following paragraphs describe the function of the components shown on the following page.

Buffer Full

A Buffer Full signal is generated by the transfer logic (A08-4) to allow DMA data to be written into the memory buffer until it is full.

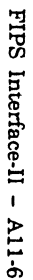
Buffer Empty

The Buffer Empty signal is generated by the transfer logic (A08-4) to allow DMA data to be read from the memory buffer until it is empty.

Transfer Control

The transfer-control logic uses various input signals including the Buffer Full and Buffer Empty signals to generate control signals and clocks necessary to transfer DMA data between the CYBER interface and the FIPS interface.

The X' register clock is used for a DMA-write operation and the R' and T' register clocks are used for a DMA-read operation. The byte-counter and block-ID clocks are used for both read and write operations. The FIPS Transfer Started and Channel Waiting signals are sent to the control-flag register of the stream logic (A10-3 and A10-2).

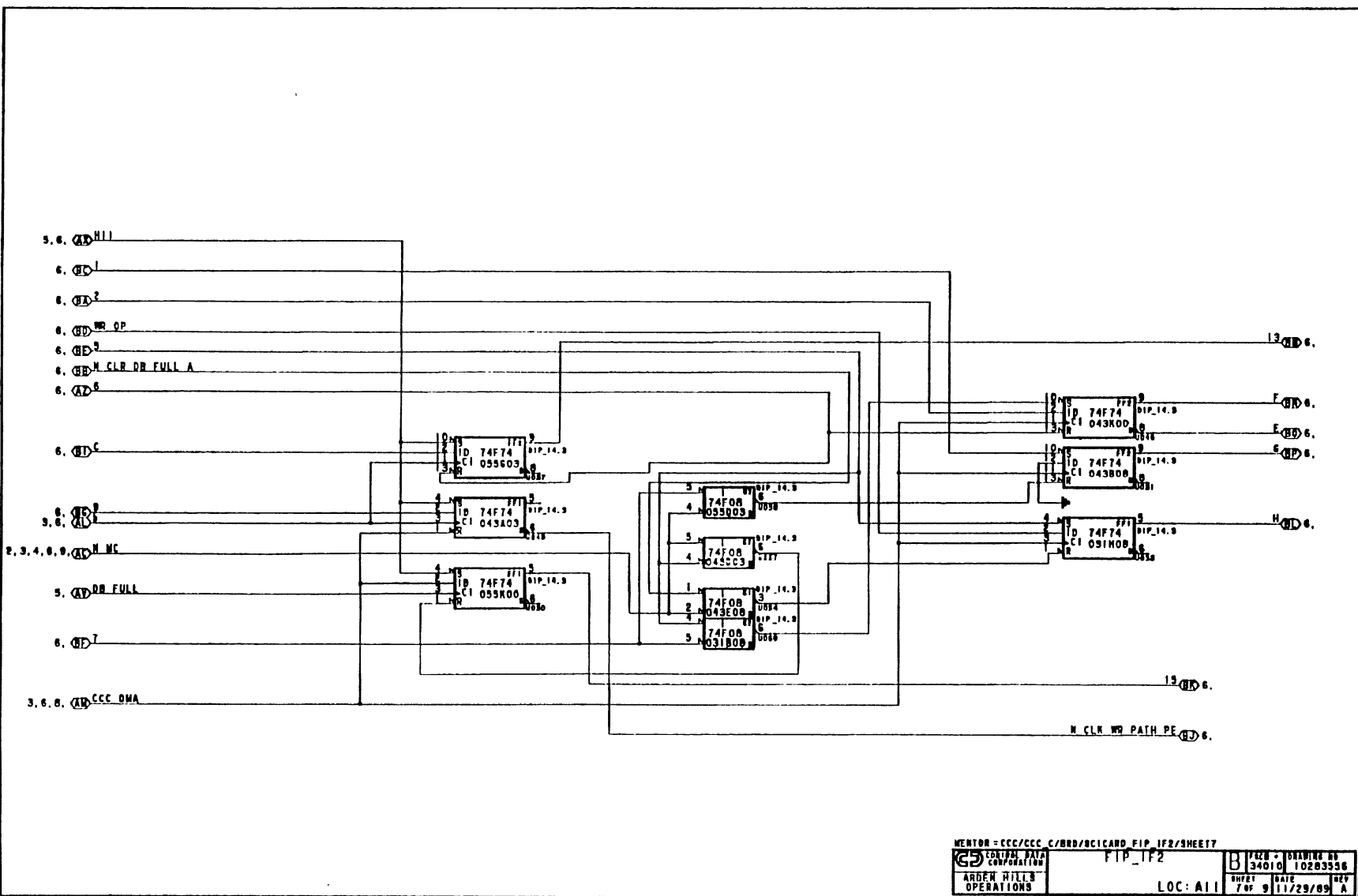


FIPS Interface-II - A11-7

The following paragraphs describe the function of the components shown on the following page.

Transfer Control

This is a part of the transfer control logic on A11-6.



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ARDEN HILLS OPERATIONS	LOC: A11	DATE: 11/29/89	REV: A

FIPS Interface-II - A11-8

The following paragraphs describe the function of the components shown on the following page.

Last Byte Control Logic

This is used to generate the last byte during data-streaming, write transfers.

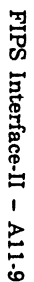


FIPS Interface-II - A11-9

The following paragraphs describe the function of the components shown on the following page.

Parity Error Latches

These two latches (FFs) hold some of the parity errors that may occur during read and write operations. The parity error signals are sent from the FFs to the control flag register of the stream logic (A10-2).



FIPS Interface-III - A12

The revision level for each sheet of the FIPS Interface-III diagrams (location A12) are listed on the logic diagram cover sheet (the following page).

PAGE						REVISION RECORD					
T	G	S	4	3	2	ED	DESCRIPTION	EXP	DATE	CHKD	APVD
A	A	A	A	A	A	CA47702	CLASS A DELAYED	EF	12/78	NS	BTJ
B	B	B	B	B	B	CA47702	SEE NOTE 4	MS	11/13/88	NS	NS
C	C	C	C	C	C	CA48239	ADDED COVER, RE-INTERSHEET	MS	11/20/87	NS	NS

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EXAMPLE '574' ON PWA-53590194 IS NOW 'F74' ON PWA-53590866

DETACHED LISTS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		E. F. ADAMS/ENR 12/85 DAS M ZAR 12/85 R. T. HENNING 02/86 W. C. B. J. FILLANE 02/86 D. T. HENNING 02/86		CONTROL DATA ARDEN HILLS OPERATIONS ST. PAUL, MINN.	
PLANT PLANT PLANT 1 1 1 1 1 1		FR205-B		PWA-53590866 PWB-53590867	
FINISH		C 34010		53590868	
THIRD ANGLE PROJECTION		A12		PAGE 1 OF 7	

FIPS Interface-III Data-Bus Receiver/Drivers and DB1 and DB2 Registers - A12-2

The following paragraphs describe the function of the components shown on the following page.

Data-Bus Drivers

During a coupler-read operation, the lower 8-bit byte (bits T1 through T8) from the T register (A12-5) is sent from the drivers to the data bus on bidirectional pins. The 8-bit byte is then written into memory (A07-3).

Data-Bus Receivers

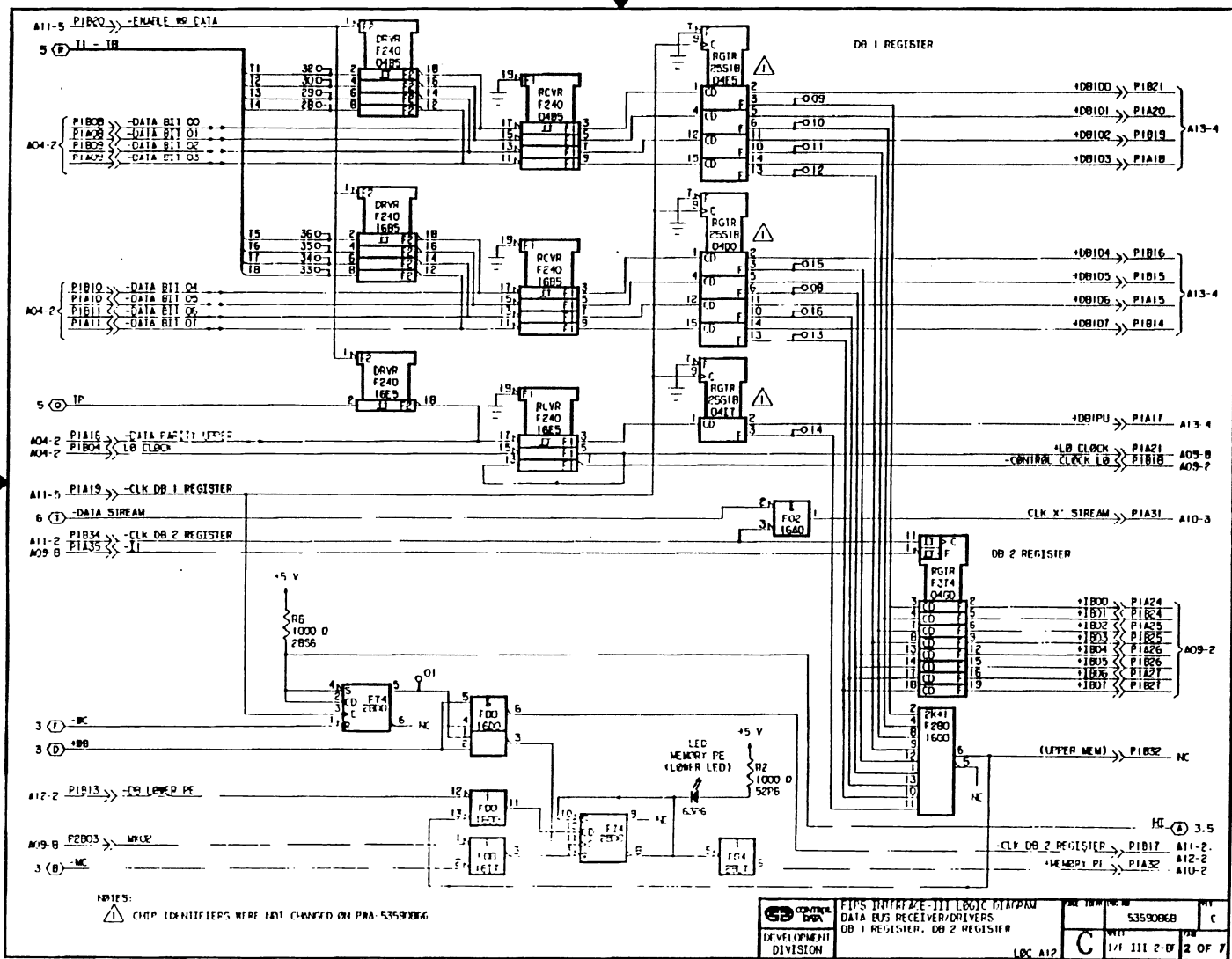
During a coupler-write operation, the lower 8-bit byte (bits 08 through 15) is read from memory onto the data bus and sent to the receivers on the same bidirectional pins used by the data-bus drivers. The receivers send the 8-bit byte to the DB1 register.

Data-Bus Registers (DB1/DB2)

The lower data-bus bytes from the data-bus receivers are clocked into the DB1 register by the Clk DB1 Register signal from the memory-control circuit (A11-5). This signal is also used to generate the Clk DB2 Register signal (A11-2) that clocks the lower data byte from the DB1 register into the DB2 register to the data-bus, parity-check circuit and the data-byte-compare circuit (A13-2). The lower data byte (bits IB08 through IB15) is sent from the DB2 register to the I bus.

Data-Bus Parity Check Circuit

This circuit performs an odd-parity check of the lower data-bus byte and associated-parity bit. The memory-parity-error LED lights if an error occurs in transmission of the lower data-bus byte.

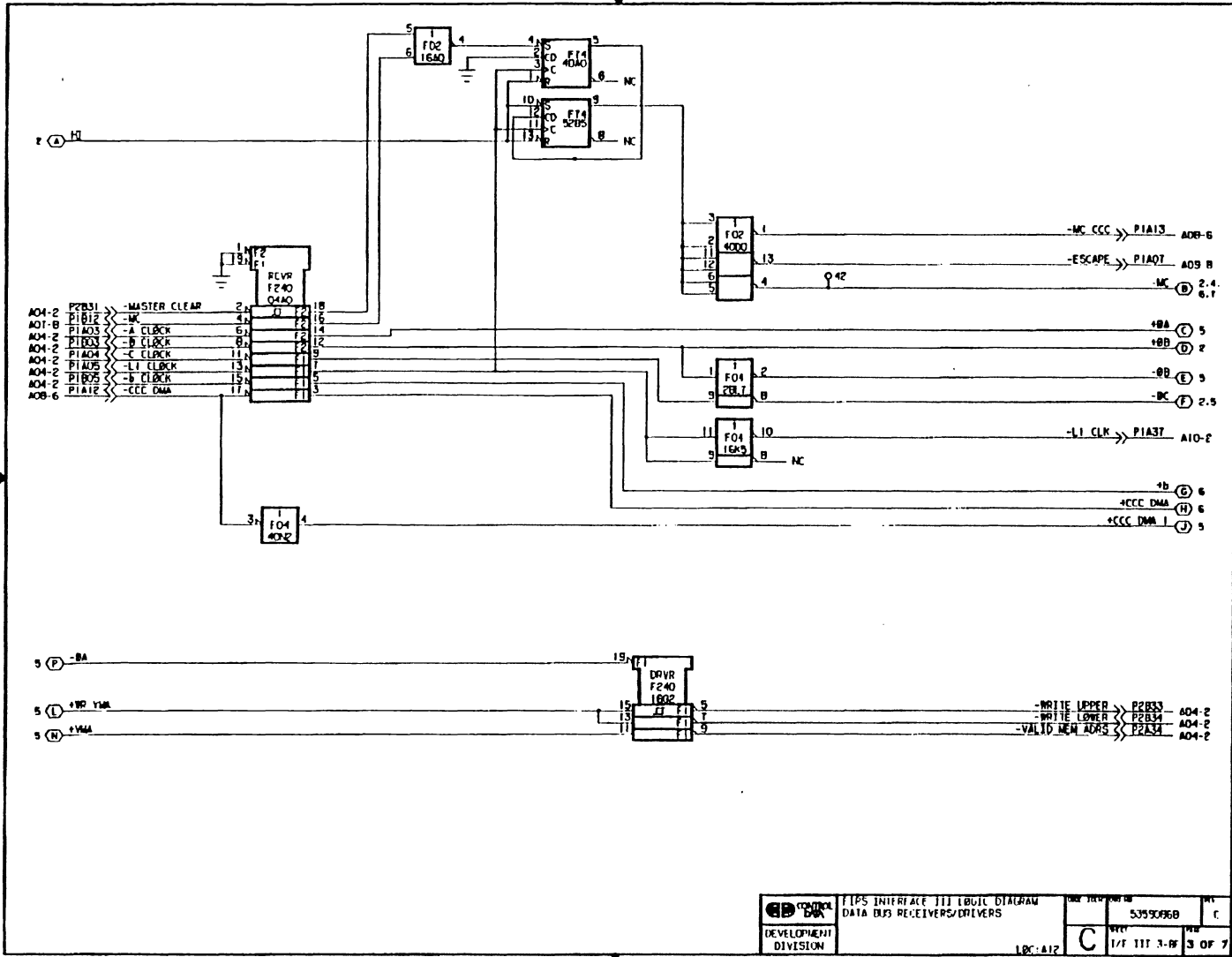


FIPS Interface-III Data-Bus Receivers/Drivers - A12-3

The following paragraphs describe the function of the components shown on the following page.

Data Bus Receivers/Drivers

Various clocks and signals including bus master clear are received from the data-bus. The data-bus drivers on this logic module are not used.



FIPS Interface-III - A12-4

The following paragraphs describe the function of the components shown on the following page.

Addressable-Latch Register

The outputs of this register are selected by microcode bits CP18 and CP21 through CP23 from the FIPS-interface UDI sequencer (A09-2). The register outputs are sent through the multiplexer circuits to the tag transmitters. The FIPS diagnostic complete LED indicator lights when the internal FIPS interface diagnostic starts running and extinguishes upon successful completion of the diagnostic test. The indicator remains lit if an error is detected.

Tag Transmitters

These circuits transmit signals on the tag lines to the external FIPS device. The tag lines control information that is present on the bus-out lines (A13-5).

FIPS Interface-III Memory Control and T and T' Registers - A12-5

The following paragraphs describe the function of the components shown on the following page.

T Register

The lower 8-bit byte of assembly/disassembly information (bits AD08 through AD15) is clocked into the T register during a UDI-read operation. The read data bits (T1 through T8) in the T register are then sent to the data-bus drivers (A12-2) and the parity generator.

T' Register

The lower 8-bit byte of data-bus information (data-in bits 08 through 15) is clocked into the T' register during a DMA-read operation. The read data bits (T1 through T8) are sent to the parity generator (A12-5) and the data-bus drivers (A12-2).

Parity Generation

A parity bit is generated on the data from the T or T' register. This parity bit (TP) is sent to the data-bus driver (A11-2) along with the read data bits (T1 through T8). The parity generator also sends a parity bit to the parity-check circuit (A11-5).

Flag Bit

This bit is used to detect illegal 6-bit codes read from the code conversion read RAM (A13-3).

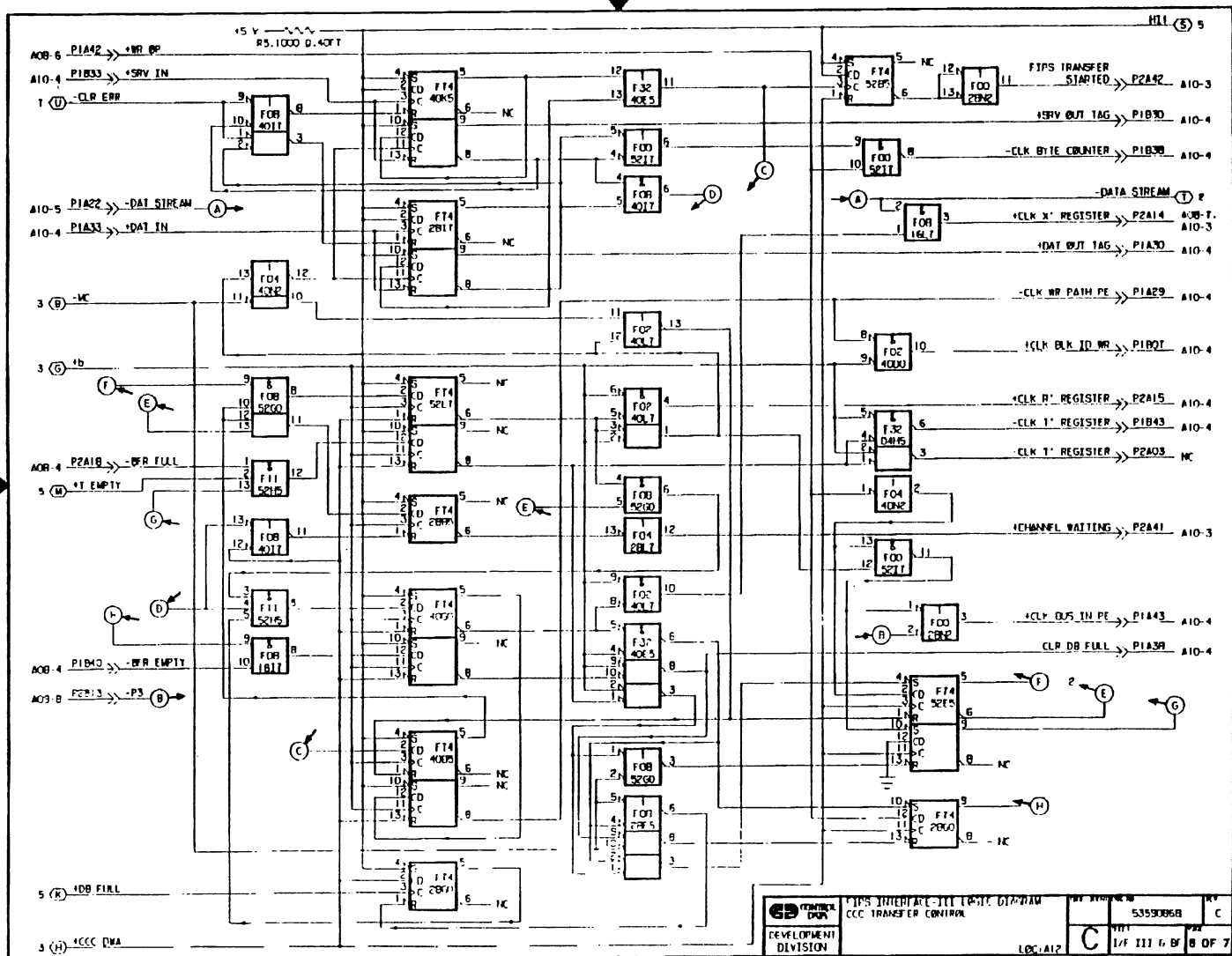


FIPS Interface-III CCC Transfer Control - A12-6

The following paragraphs describe the function of the components shown on the following page.

Transfer-Control Circuits

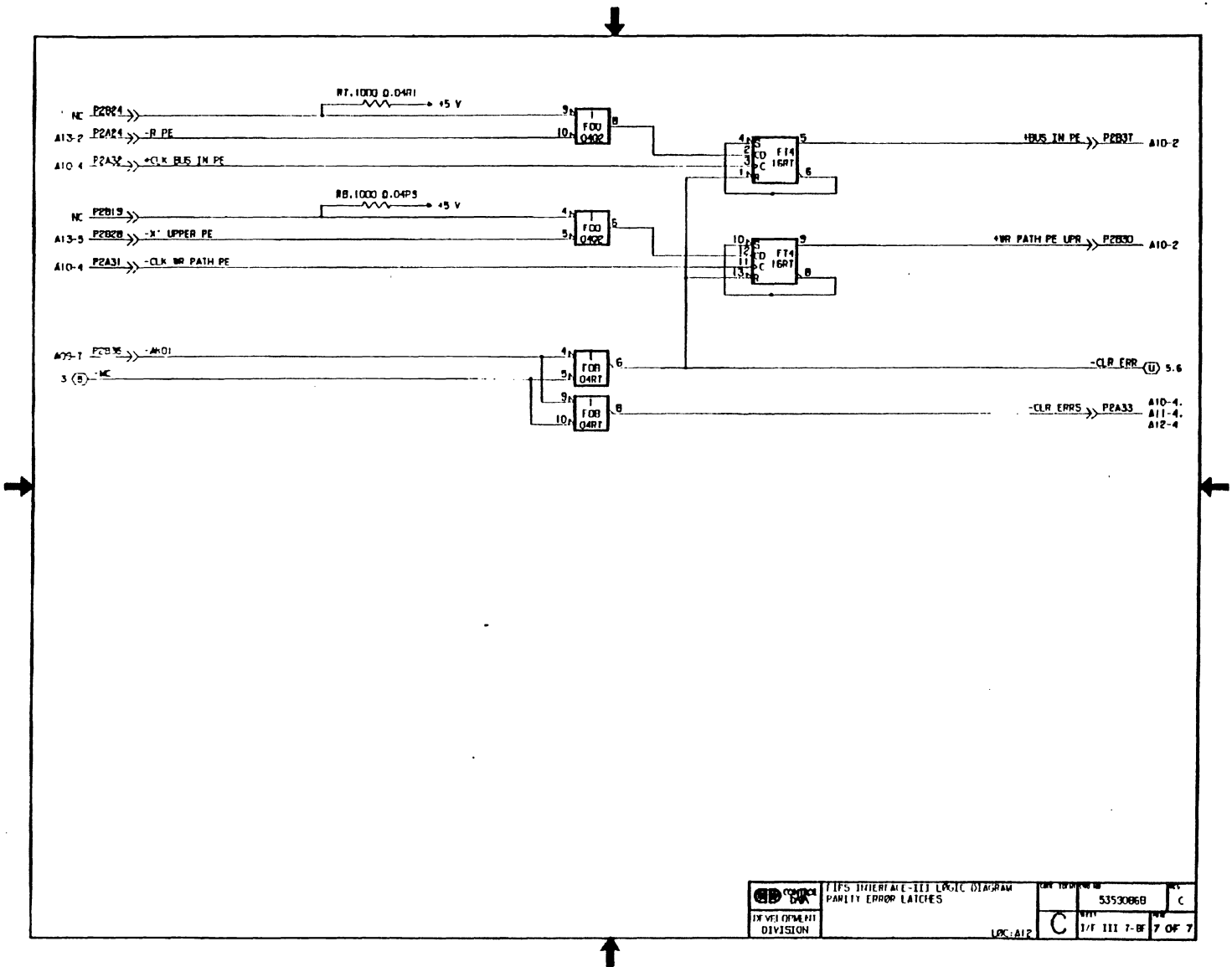
The transfer-control circuits are not used on this logic module. Transfer control is performed by logic module A11-6.



60 DEVELOPMENT DIVISION	FIPS INTERFACE-III LOGIC DIAGRAM CCC TRANSFER CONTROL	53590968 1/1 III 6 BF	8 OF 7
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FIPS Interface-III Parity-Error Latches - A12-7

The FIPS Interface-III parity error latches diagram (location A12-7) is shown on the following page.



FIPS Interface-IV - A13

The revision level for each sheet of the FIPS Interface-IV logic diagrams (location A14) are listed on the logic diagram cover sheet (the following page).

PAGE						REVISION RECORD					
#	5	4	3	2	1	EDP	DESCRIPTION	EFF	DATE	CHKD	APVD
A	A	A	A	A	A		CLASS A RELEASED	EFA	11/7/86	N2	RTH
B	B	B	B	B	B	CA47702	SEE NOTE 4	MES	8/18/86	NS	NS
C	C	C	C	C	C	CA48533	ADDED COVER RE-INTERPRET	MES	12/28/87	NS	NS
D	D	D	D	D	D	CA48533	SEE NOTE 5	MES	12/30/87	NS	NS
E	E	E	E	E	E	CA48580	CHANGED #29 LOC TO 28Q2	MES	7/13/87	NS	NS
F	F	F	F	F	F	CA49200	SEE C.8	NAS	8/13/87	NS	NS
G	G	G	G	G	G	CA49213	SEE C.8	NAS	9/15/87	NS	NS

NOTES:

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2. UPDATES TO LOGIC PRINTS MUST BE PERFORMED BY CALMA.
3. THE OFF SHEET SIGNAL REFERENCES DESIGNATE THE PAGE IN THE TITLE BLOCK AREA ON DIAGRAMS.
4. THE CHIP IDENTIFIERS ON PWA-53590844 WERE CHANGED TO "F" TYPE CHIPS, UNLESS OTHERWISE NOTED. EXAMPLE "S14" ON PWA 22154591 IS NOW "F14" ON PWA-53590844.
5. THE "F174" CHIP AT LOCATION 04K5 AND THE "F175" CHIP AT LOCATION 16A5 WERE CHANGED BACK TO "S174 AND S175" CHIPS. ADDED 330 PPM RESISTOR BETWEEN PINS P1A23 AND P1A30. SEE PAGE 6.

CONTROL DATA ARDEN HILLS OPERATIONS ST. PAUL, MINN.		PWA-10283690 PWB-53590845	
LOGIC DIAGRAM FIPS I/F 4		53590846	
FR205-B		C 34010	
013		1/1 1/1 1/1	

(SEE LOWER)

FIPS Interface-IV Bus-In Receivers, R Register, and I-Bus Mux - A13-2

The following paragraphs describe the function of the components shown on the following page.

Bus In

Bus-in bits 0 through 7 carry read-data or status information from the tape or disk device to the coupler. The bus-in receivers route the bus-in information to the R register, the parity check circuit, the code conversion read RAM (A13-3), and the block-ID generator multiplexer (A13-6).

Parity-Check Circuit

This circuit performs an odd-parity check of the eight bus-in bits and associated-parity bit. A bus-in parity error is sent to the control-flag register (A11-7 and A10-2) if an error occurs during transmission of bus-in data from the tape or disk device.

R Register

The bus-in bits are clocked into the R register by the -P3 clock from the FIPS interface UDI (A09-8). The bus-in bits are then sent from the R register to the data-byte-compare circuit and the I-bus multiplexer.

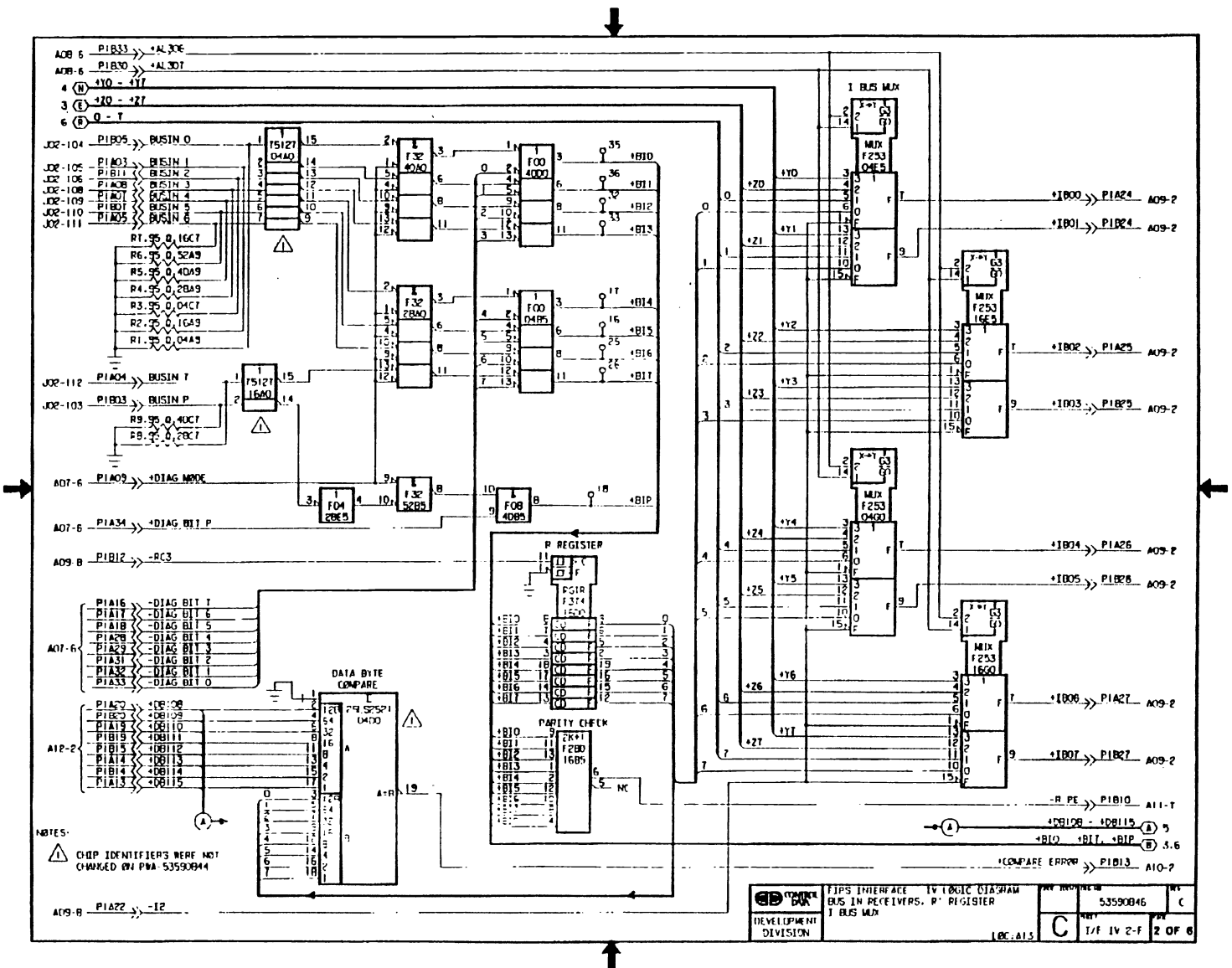
Data-Byte Compare Circuit

The data-byte-compare circuit compares the expected bus-in byte (bits DB108 through DB115) with the last actual bus-in byte (bits BI0 through BI7) received by the R register. A compare error is sent to the control-flag register (A10-2) if the bytes are not identical.

I-Bus Mux

Addressable-latch bits AL306 and AL307 form a code to enable the multiplexer to gate the following information to the I bus.

AL306	AL307	I-Bus Information
0	0	R register (bits BI0 through BI7)
0	1	Block ID (bits 0 through 7)
1	0	Read-conversion memory (bits Z0 through Z7)
1	1	Write-conversion memory (bits Y0 through Y7)



FIPS Interface-IV Read Conversion and R' Register - A13-3

The following paragraphs describe the function of the components shown on the following page.

Load Code

When the processor selects a load-code, read-table operation, bits CT0 through CT7 from the address counter (A13-4) are gated through the multiplexer and sent to the code conversion read RAM. These bits provide the addresses for loading conversion codes (bits BO0 through BO7) into the RAM.

Copy Code

When the processor selects a read-(copy)-code, read-table operation, bits CT0 through CT7 from the address counter (A13-4) are gated through the multiplexer and sent to the code-conversion read RAM. These bits provide the addresses for reading the conversion codes from the code-conversion read RAM and transferring them to the R' register.

Code-Conversion Read Operation

When data is read with code conversion, the data character (bits BI0 through BI7) from the tape device is used as an address to read its corresponding conversion code from the code-conversion read RAM. This coded character is eventually sent to the CYBER channel in place of the tape device data character.

When data is read with code conversion disabled, bus-in bits BI0 through BI7 are gated through the driver and bypass the code conversion read RAM.

Code Table Select

The code-table-select signals form a code to select one of four tables in the code-conversion read RAM as follows.

Code Table Sel 0	Code Table Sel 1	Table
0	0	1
0	1	2
1	0	3
1	1	4



FIPS Interface-IV Write Code-Conversion Load Counter - A13-4

The following paragraphs describe the function of the components shown on the following page.

Load Code

When the processor selects a load-code, write-table operation, assembly/disassembly bits AD00 through AD07 are clocked through the address counter (bits CT0 through CT7), gated through the multiplexer and sent to the code conversion write RAM. These bits provide the addresses for loading conversion codes (bits BO0 through BO7) into the RAM. The address counter increments by one each time a conversion code is entered.

Copy Code

When the processor selects a read-(copy)-code-write-table operation, assembly/disassembly bits AD00 through AD07 are clocked through the address counter (bits CT0 through CT7), gated through the multiplexer, and sent to the code-conversion write RAM. These bits provide the address for reading the conversion codes from the RAM. The address counter increments by one each time a conversion code is read.

Code-Conversion Write Operation

When data is written with code conversion, the data character (bits DB100 through DB107) from the CYBER channel is used as an address to read its corresponding conversion code from the code-conversion write RAM. This coded character is eventually sent to the tape device in place of the CYBER channel data character.

When data is written with code conversion disabled, data-bus bits DB100 through DB107 are gated through the driver and bypass the code-conversion write RAM.

Code Table Select

The code-table-select signals form a code to select one of four tables in the code-conversion write RAM as follows.

Code Table Sel 0	Code Table Sel 1	Table
0	0	1
0	1	2
1	0	3
1	1	4



FIPS Interface-IV X and X' Register and Bus-Out Transmitters - A13-5

The following paragraphs describe the function of the components shown on the following page.

X' Register

Data-bus information (bits Y0 through Y7) is clocked into the X' register during a direct-memory-access (DMA) write operation. The write data bits (BO0 through BO7) from the X' register are then sent to the FIPS device on the bus-out lines. The X' register bits are also sent to the parity generator (A13-5) and the block-ID generator (A13-6).

X Register

Assembly/disassembly information (bits AD00 through AD07) is clocked into the X register during a UDI-write operation. The write data bits (BO0 through BO7) from the X register are then written into the code-conversion read RAM (A13-3) or code-conversion write RAM (A13-4) during a load-conversion-code operation or sent directly to the FIPS device on the bus-out lines during a normal-write operation.

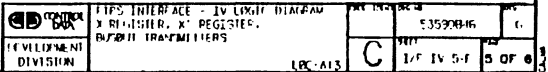
The X register bits are also sent to the parity generator (A13-5) and the block-ID generator (A13-6).

Parity Generation

A parity bit is generated on data from either the X' or X register. The parity bit is sent to the external FIPS device on the bus-out P line, to the control-flag register (A10-2) and the parity-check circuit (A13-5).

Parity Check Circuit

This circuit compares the DMA-write, data-parity bit (YP) with the parity bit generated from the DMA-write data after it passes through the X' register. A write-path parity error is sent to the control-flag register (A10-2) if an error occurs in transmission of DMA-write data.

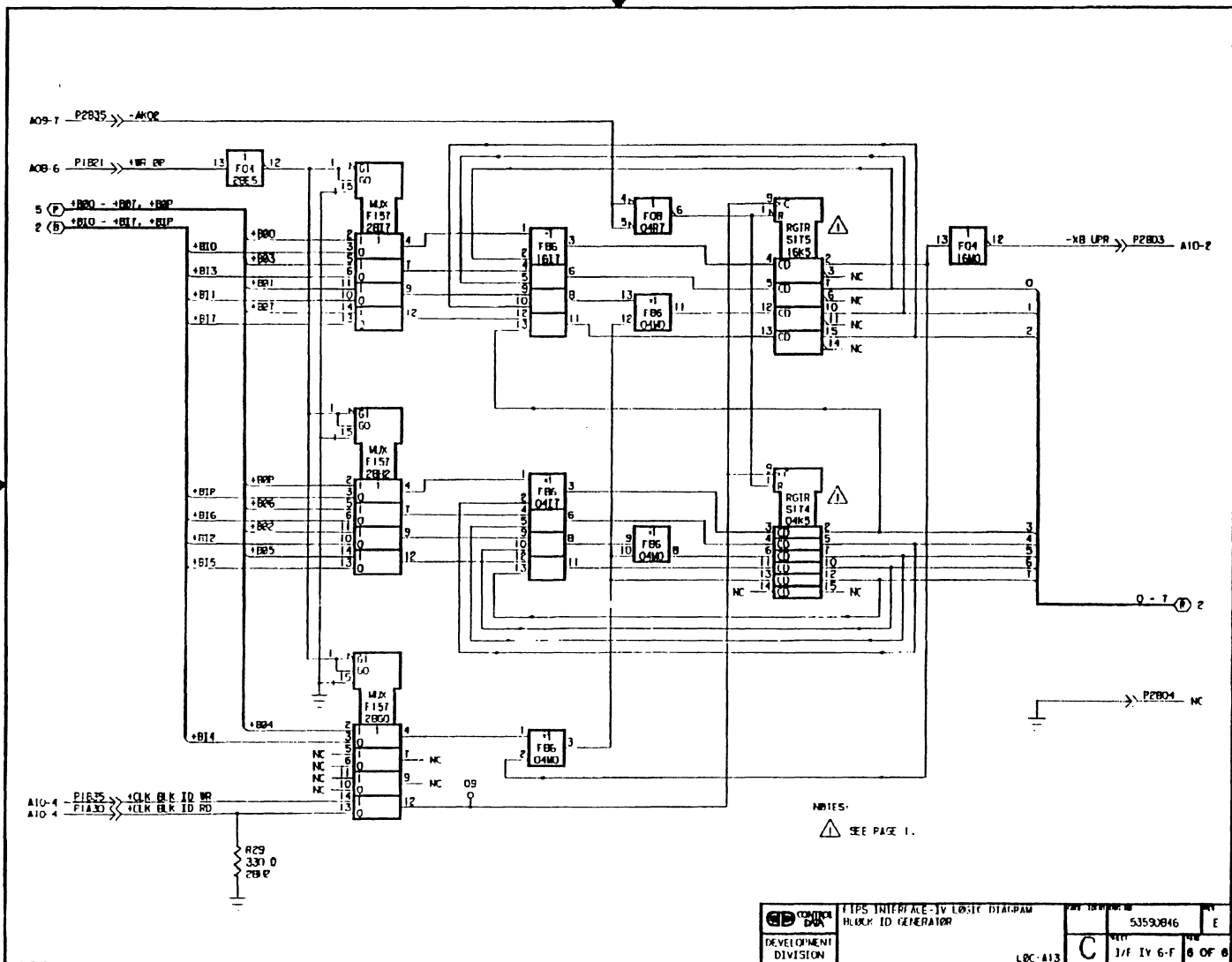


FIPS Interface-IV Block-ID Generator - A13-6

The following paragraphs describe the function of the components shown on the following page.

Block ID Generator

This cyclic generator provides a 9-bit identification code for each block of bus-in data (BI0 through BI7, BIP) during a read operation and each block of bus-out data (BO0 through BO7, BOP) during a write operation. The upper bit of the block ID (X8 Upr) is sent to the control-flag register (A10-2) while the other eight bits are sent to the I-bus multiplexer (A13-2). The block ID is read when the processor performs a read block-ID operation.



Maintenance - A14

The revision level for each of the maintenance logic diagrams (location A14) are listed on the logic diagram cover sheet (the following pge).

PAGE					REVISION RECORD					
5	4	3	2	1	ECO	DISCRIPTION	DRFT	DATE	CHKD	APVD
A	A	A	A	A		CLASS A RELEASED	GRH	5/19/87	GRH	GRH
B	A	A	A	B	CA49260	MAINT BD -CLK LED REQ	GRH	10/5/87	GRH	GRH

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3 THE OFF SHEET SYMBOL REFERENCES DESIGNATE
THE PAGE IN THE TITLE BLOCK AREA ON DIAGRAMS.

DRWN	G R HODD	5/19/87	TITLE LOGIC DIAGRAM MAINTENANCE BOARD PWA 19285797 PWB 22118278
CHKD	G R HODD	5/19/87	
ENGR	G R HODD	5/19/87	
APVD	L B ULFIG	5/19/87	
EQUIP. NO. FR205-B			PENTON - CCC/CCC-CA/MAINT. CR. COVER SHEET CONTROL DATA CORPORATION MAINTENANCE BOARD RADEN HILLS OPERATIONS SHEET 1 OF 5 DATE 10/5/87 REV 8 LOC: A14 APOLLO









19404-1/10 Power Distribution Diagram

400-Hz and 50/60-Hz Input Power

The 400-Hz input power feeds the +5-V and -5-V logic power supplies (A5, A6A3, and A6A1), and the 50/60-Hz input power is used to run the A4B1 blower motor.

When the POWER DISCONNECT 400-HZ circuit breaker (A7CB1) is placed in the ON position, one line of the 400-Hz power is routed to pin 5 of the A4J1 connector. This power is applied through the A4A1S1 high-temperature sensor to the A7XK1 relay, and the relay energizes. This enables the same line of the 400-Hz power to be routed through a closed contact of the A7XK1 relay to energize the A7K3 relay. All three lines of the 400-Hz power are now applied through the A7CB1 circuit breaker, and through the closed contacts of the A7K3 relay to the +5-V and -5-V power supplies. The A7CB1 circuit breaker also provides overload protection for the power supplies.

Placing the POWER DISCONNECT 50/60-HZ switch (A7S1) in the ON position applies 50/60-Hz power to the A4B1 blower motor.

High-Temperature Sensor (A4A1)

Under normal temperature conditions, 400-Hz current flows through the R1 resistor and the S1 high-temperature sensor and energizes the A7XK1 relay. This, in turn, enables the A7K3 relay to energize and applies 400-Hz power to the +5-V and -5-V logic power supplies. The R1 resistor heats the S1 high-temperature sensor, but airflow from the B1 blower maintains the temperature around the sensor below 55°C (130°F).

High-Temperature Operation

If the cabinet temperature rises to 55°C (130°F) because of blower failure or other reasons, current through the A4R1 resistor causes the A4S1 high-temperature sensor to open. This removes 400-Hz power from the A7XK1 relay, and it deenergizes. This, in turn, enables the A7K3 relay to deenergize and remove 400-Hz power from the logic power supplies to stop operation. Also when A7XK1 deenergizes, 400-Hz ground is applied through a closed contact of the relay to pin 4 of the A4J1 connector. This enables the 400-Hz power to light the AIRFLOW SENSOR RELAY indicator (test lamp A4DS1).

The high-temperature sensor may be checked for proper operation by pressing and holding the AIRFLOW SENSOR BLOWER OFF switch (test switch A4S1). This removes 50/60-Hz power from the A4B1 blower motor. Within approximately 1.5 minutes, the high-temperature sensor (A4A1S1) should open and cause the +5-V and -5-V logic power supplies to shut down and the AIRFLOW SENSOR RELAY indicator to light. Release the AIRFLOW SENSOR BLOWER OFF switch. Place the POWER DISCONNECT A7S1 switch in the OFF position for approximately 5 minutes and then back to the ON position to resume normal operation. If necessary, reset the POWER DISCONNECT 400-Hz A7CB1 circuit breaker.

To present the information in this chapter in a structured format, this page has been left blank.

Meter Circuit (A5A1)

The +5-V and -5-V power supplies apply power to the meter circuit. The METER SELECTOR S1 switch selects either +5 V or -5 V as the input voltage to the 0 percent, M1 meter. The meter is adjusted for a zero percent indication for both the +5-V and -5-V inputs with variable R4 resistor. The 6-V and 12-V inputs and R5 and R6 associated variable resistors are not used.

Convenience Outlet (A7J10)

This 120-V, 50/60-Hz outlet is protected only by the 7-A, A7CB2 circuit breaker. For this reason, it should be used only with low power electrical equipment drawing less than 7 A.

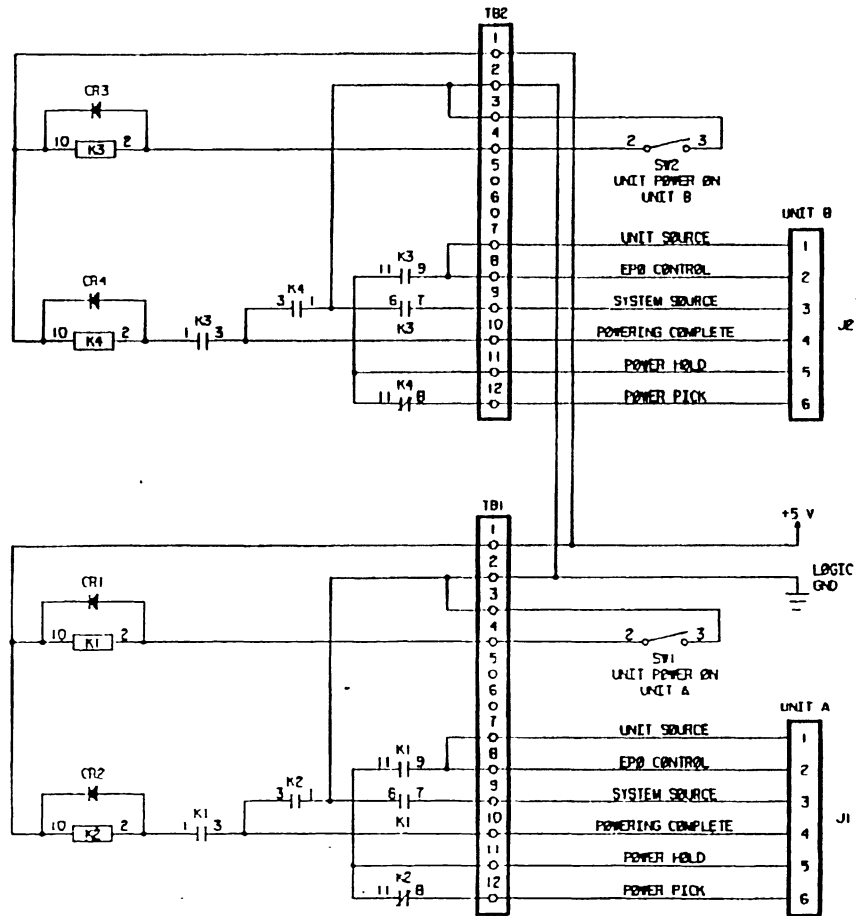


19404-1/10 CCC Power Interface Diagram

When the UNIT A POWER-ON switch (SW1) is placed in the ON position, the K1 relay energizes. This allows the K1 relay contacts to close, which routes 24 volts dc from the CCC subsystem on the unit source line back to the CCC subsystem on the power hold line. The same closed contacts of the K1 relay and normally closed contacts of the K2 relay also route the 24 volts back to the CCC subsystem on the power pick line. Closed contacts of the K1 relay also route coupler logic ground to the CCC subsystem on the system source line. The CCC subsystem then returns a ground signal on the powering complete line and the K2 relay energizes. This allows the normally closed contacts of the K2 relay to open and drop the power pick voltage to the CCC subsystem. In case the powering complete ground signal drops, the K2 relay is held energized by a logic ground latch through closed contacts of the K2 and K1 relays. The emergency power off (EPO) control line from the CCC subsystem is not controlled by the coupler.

When the UNIT A POWER-ON switch (SW1) is placed in the OFF position, logic ground is removed from the K1 relay and it deenergizes. Contacts of the K1 relay open and drop 24 volts on the power hold line and logic ground on the system source line. Open contacts of the K1 relay also deenergize the K2 relay and the circuit completely shuts down.

The UNIT B POWER-ON circuit functions in the same manner as the UNIT A POWER-ON circuit.



NOTES:

1. SWITCHES SHOWN IN OFF POSITION.
RELAYS SHOWN IN DEENERGIZED POSITION.



CCC POWER INTERFACE DIAGRAM

DEVELOPMENT
DIVISION

FR205-B

C

PWR INTRC

19404-2/11 Power Distribution Diagram

The following pages describe the power distribution system for a 19404-2 or 19404-11 CYBER Channel Coupler. Refer to figures on opposing pages for schematics which accompany the descriptive text.

Power Distribution Box (A7)

The A7 power distribution box contains the following major components.

- 50/60-Hz power distribution switch/circuit breaker (CB1)
- Electromechanical interference filter (FL1)
- 2:1 step-down transformer (T1)
- Housekeeping power supply

50/60-Hz Power Distribution (CB1)

The 19404-2 or 19404-11 CCC is fed with 50/60-Hz input power when the 50/60-Hz POWER DISCONNECT switch/circuit breaker (A7CB1) is placed in the ON position.¹ From the A7TB2 terminal block, the 220/240-V ac input power is distributed to the primary leads of the A7T1 transformer to pins 1 and 2 of the A7J2 jack, and to pins 3 and 1 of the A7P1 plug (which in turn connects to the housekeeping power supply).

Transformer (T1)

This component converts 220/240-V ac input voltage into 115-V output voltage. This voltage, which is distributed from the secondary leads of T1 to pins 1 and 2 of the A7J1 jack, ultimately powers the A4B1 blower.

Housekeeping Power Supply

This component converts 220/240 V ac input power into the following dc outputs.

Output Pin	DC Output	Destination
J2-1	+12 V	P2-1 to J1-4
J2-2	+5 V	P2-2 to J3-1
J2-3	+5 V	P2-3
J2-4	Common	P2-4 to J2-3
J2-5	Common	P2-5 to J3-2
J2-6	-12 V	P2-6

1. Circuit breaker A7CB1 provides overload protection for the 19404-2/11 CCC.



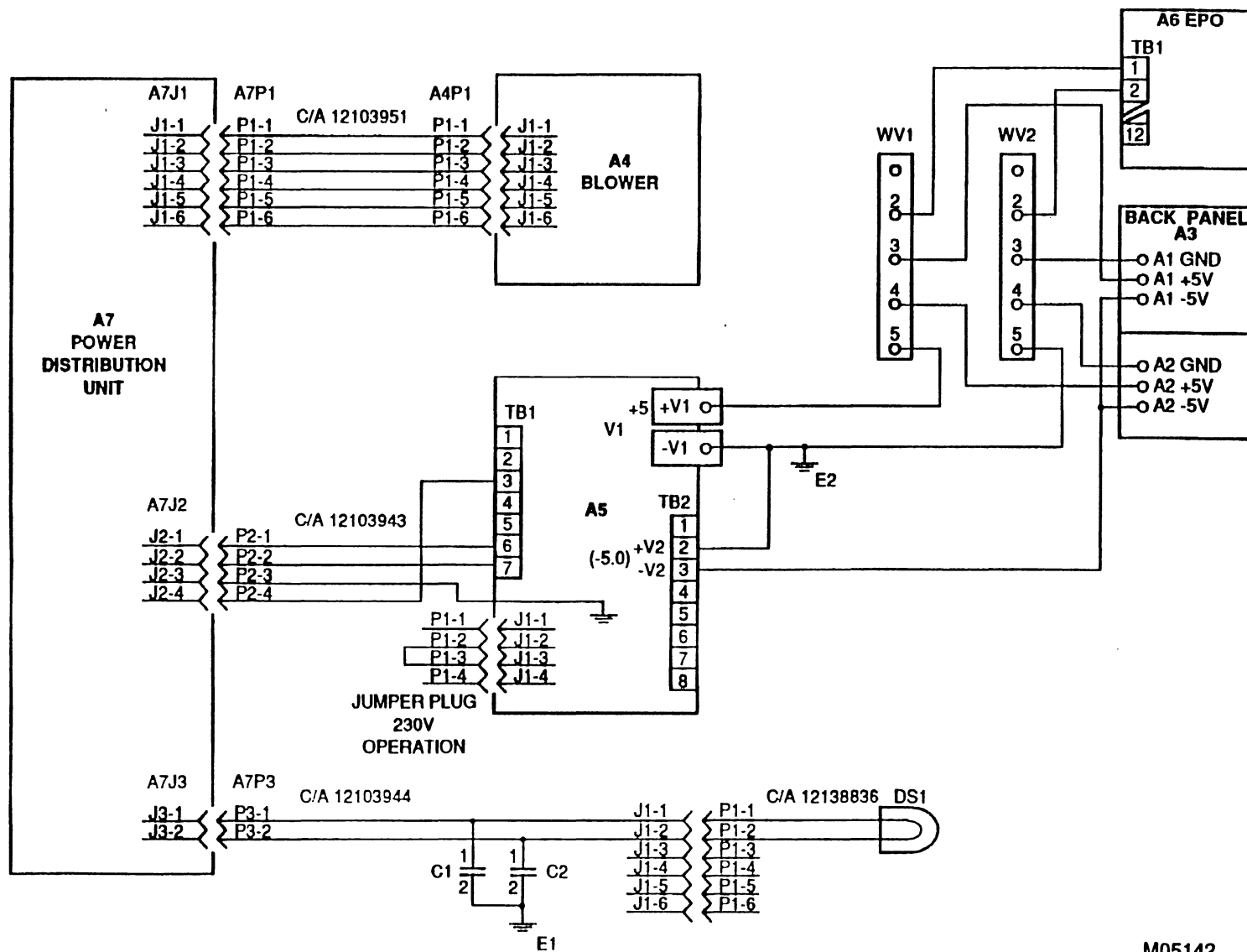
Blower Housing (A4)

The blower housing contains the A4B1 blower and the airflow sensor. Refer to the following pages for a more detailed illustration and description of the blower unit.

Power Supply (A5)

This component accepts 220/240-V ac input voltage from pins 1 and 2 of the A7J2 jack. It then converts this input to +5-V dc and -5-V dc output voltages (V1 and V2, respectively). The V1 output supplies +5 V-dc to the internal logic boards via the bus bar and ground, while the V2 output supplies -5 V dc directly to the -5-V leads of the A3 backpanel.

The A5 power supply also receives a signal from the CCC airflow sensor. Under normal operating conditions, the output of the airflow sensor is open and 2.5 V dc or greater is present at pin 3 of A5TB1. When the airflow sensor detects abnormally low airflow, the signal is closed (grounded), dropping below 2.5 V. This will result in the power supply shutting itself down.



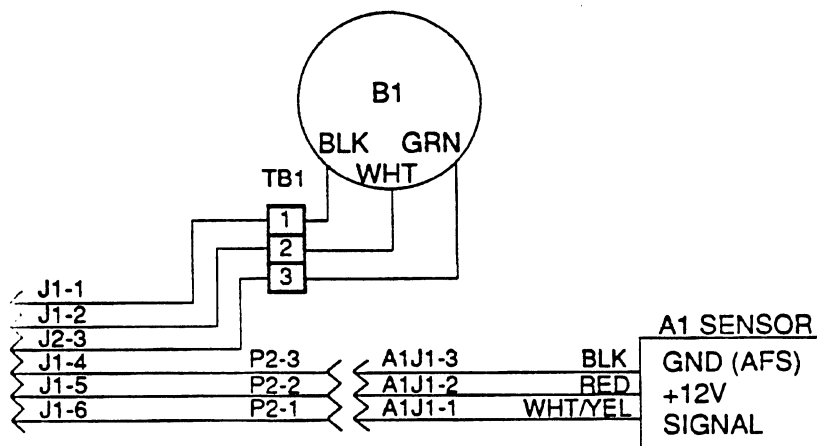
M05142

Blower (A4B1)

This component operates on 115 V from the secondary of the A7T1 transformer. The blower will operate as long as A7CB1 is ON.²

Airflow Sensor (A4A1)

This component monitors the airflow within the CCC cabinet. During normal operation, it sends a continuous 2.5-V or greater (normally open) signal to the TB1-3 connector of the A5 power supply. If the airflow drops below a predetermined level, the output signal from the airflow sensor closes, dropping below 2.5 V. This results in the power supply shutting itself off.



M05143

² The blower will operate even if the airflow sensor shuts down power supply A5 due to excessively low air flow.

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This chapter provides information to assist the customer engineer (CE) in troubleshooting and performing maintenance on the CYBER Channel Coupler (the coupler). The material presented assumes a basic familiarity with the coupler, the CDC CYBER 170/180 Computer System, HPA, MALET, and DEMOT. Knowledge of basic maintenance techniques, including use of common CE tools and test equipment, is also required. The maintenance information covers checks, adjustments, removal, and replacement of the field-replaceable units (FRUs) as directed by the associated structured analysis method (SAM) listings (see chapter 7) for the coupler. Information is organized under the following major headings.

- General Maintenance Information
- Preventive Maintenance Task Procedures
- Maintenance Aids
- Explanation of SAM Format
- Organization of SAMs and Procedures

General Maintenance Information

The following paragraphs provide general maintenance information that the CE should be familiar with before troubleshooting and performing maintenance on the coupler. These are:

- Safety Precautions
- MOS Circuit-Handling Precautions
- Maintenance Tools and Materials

Safety Precautions

Observe the following safety precautions at all times.

⚠ WARNING

Failure to observe safety precautions may cause equipment damage and/or personal injury.

- Hazardous voltages exist in the equipment cabinets. Do not attempt repair unless qualified to do so.
- Exercise caution any time checks or adjustments are being made with power applied to coupler.
- Always turn power off when removing/replacing components or cables.

MOS Circuit-Handling Precautions

The following special handling procedures are necessary for printed circuit boards containing metal-oxide semiconductor (MOS) integrated circuits.

⚠ CAUTION

MOS ICs are susceptible to damage from static electricity. To prevent damage to MOS circuits, observe the following precautions when handling PC boards.

- Turn power off before removing/installing or otherwise connecting/disconnecting any circuits.
- Ensure that any item that comes in contact with the PC board is electrically grounded.
- Wear wrist ground straps to bleed off any accumulated static charge while handling or removing/installing PC board.
- Handle PC board only by a noncircuit portion of board. Connector pins and etched circuit paths must not be touched.
- Place PC board in a special conductive envelope whenever board is removed from chassis.

Maintenance Tools and Materials

The maintenance procedures for the coupler only require the use of common CE hand tools and test equipment. No special test equipment, tools, or materials are required.

Preventive Maintenance Task Procedures (PMTP)

Perform the airflow sensor test and air filter cleaning procedures as defined in chapters 8 and 9 of this manual.

6

Maintenance Aids

Several maintenance aids are available to the CE to assist in isolating and identifying the cause of faults within the coupler. The primary maintenance aids for fault isolation are the internal diagnostics, the down-line diagnostics, and the SAM troubleshooting listings. The SAMs are structured to isolate failures to FRUs based on diagnostic error codes and other fault symptoms that may be present. The SAMs also provide a procedure number reference to the applicable remove/replace/adjustment procedure that is to be used to correct the malfunction. The SAMs and remove/replace/adjustment procedures are contained in chapters 7 and 8, respectively.

Descriptions of the diagnostic tests and other maintenance aids available to the CE are described under the following headings.

- Coupler Internal Diagnostics
- Coupler Internal Diagnostic Error Codes
- Coupler Down-Line Diagnostics
- Peripheral Processor Diagnostic Functions
- CYBER Channel Interface Diagnostic Functions
- 0070-FIPS Device I/F Diagnostics Function
- CYBER Channel Parity Error Detection and Processing
- Deadman Timer Feature
- Coupler Memory Locations
- Coupler Maintenance Board
- HPA/MALET/DEMOT Execution

Coupler Internal Diagnostics

The three internal (PROM resident) self-test diagnostics provided to test the coupler are:

- CYBER channel interface diagnostic
- CYBER channel interface/processor interaction diagnostic
- FIPS device interface/processor interaction diagnostic

These diagnostics are executed sequentially following a power-on application, following a master clear, during a 0070 channel interface diagnostics function from the PP, during a 0414 autoloader coupler microcode from PP function, or during a 06uu autoloader coupler microcode from device function. If all of the diagnostic tests run without error, the processor is placed into an idle loop at location 8400, waiting for a function code from the PP. The internal diagnostic tests are described in the following paragraphs.

CYBER Channel Interface Diagnostic

The CYBER channel interface diagnostic tests the internal logic circuits of the CYBER channel interface. This diagnostic consists of seven sections (sections 0 through 6). At the start of each section, an interrupt corresponding to that section is set (for example, interrupt 0 is set for section 0). The interrupt flip-flops are not used by the internal logic in the coupler; however, they provide sync points for maintenance troubleshooting use. The flip-flops remain set until a master clear is received.

Switch SW1-5 on module A05 of the CYBER channel interface logic allows the microcode to loop on the internal diagnostic when placed in the ON position. If an error or end-of-test is detected and the switch is ON, the microcode repeats the diagnostic starting with section 0. If an error is detected and the switch is in the OFF position, the microcode loops on an address (hangs).

Upon successful completion of the internal diagnostic with switch SW1-5 in the OFF position, the microcode turns off the CYBER channel interface diagnostic LED (LED 5 on the A05 module) and jumps to the idle routine.

The following paragraphs briefly describe each of the diagnostic sections.

Section 0

Section 0 loads the address counter with all ones and the length counter with all zeros to check the length = 0 status. It then checks that decrementing the length does not increment the address and vice-versa. It also checks that simultaneously incrementing the address and decrementing the length executes successfully.

Section 1

Section 1 loads the address counter with all zeros and the length counter with all ones. It then decrements the length counter to zero while incrementing the address counter and checking the address for nonzero. It also increments the address counter and checks for all zeros using length = 0 status.

Section 2

Section 2 begins with all zeros loaded into the address counter and then executes four pushes, incrementing the address each time. It next transfers the address value to the length counter and executes four pops, decrementing the length counter each time. It checks for a length = 0 status after four pops.

Section 3

Section 3 checks all shift counts and tests each bit to ensure that a bit has not been inadvertently set. It then checks all shift counts and tests each bit to ensure that a bit has not been inadvertently cleared.

Section 4

Section 4 checks for constant assembly/disassembly clocks and also for missing assembly/disassembly clock pulses.

Section 5

Section 5 checks the bit setting and bit clearing capabilities by issuing different shift counts to set and clear the same bit.

Section 6

Section 6 writes an address pattern in the register file and checks it using the address and length counters. It then loads the complement address pattern in the register file and checks it.

CYBER Channel Interface/Processor Interaction Diagnostic

This diagnostic tests the communication and interaction between the CYBER channel interface and the processor. The CYBER channel interface first loads the address counter with the contents of memory location 0021₁₆ and reads 16 words into the register file. The CYBER channel interface then loads the address counter with the contents of memory location 0022₁₆ and writes 16 words from the register file. If a memory parity error is detected while reading the op code or memory location 0021₁₆, no data is read. The CYBER channel interface sets bit 12 (control package parity error) in memory location 0024₁₆, lights the memory parity error LED (LED 3 on module A04), and returns to the idle routine.

If a memory parity error is detected while reading data, the CYBER channel interface attempts to write the data back into memory and sets bit 10 (memory parity error) in memory location 0024₁₆. If a memory parity is detected while reading memory location 0022₁₆, no data is written and the CYBER channel interface sets bit 12 (control package parity error) in memory location 0024₁₆ and lights the memory parity error LED (LED 3 on module A04).

If a memory parity error is detected while reading data or while reading memory location 0022₁₆, both a control package parity error status (bit 12) and a memory parity error status (bit 10) is returned to the processor. If no errors are detected, the CYBER channel interface writes the data to memory and sends a normal end status (bit 8) to the processor.

FIPS Device Interface/Processor Interaction Diagnostic

This diagnostic tests the communication and interaction between the FIPS device interface and the processor. An initialization control sequence consisting of a system reset followed by a halt is performed prior to each test segment. The initialization control sequence stores the starting address of the test segment to be executed in address 0028, and clears the ending status contained in location 002A. Execution of the test segment begins by performing a write instruction at location E000. At the completion of each test segment, the ending status stored in address 002A is checked for a nonzero condition. Normal completion is indicated by bit 0 being set, and an error is indicated by bit 0 being clear with the error status contained in bits 4 through 15.

The diagnostic uses block multiplexer mode to load the transfer registers with various data patterns and read back each data pattern for comparison. The patterns tested are all ones and alternating ones and zeros (using first 5555₁₆, then AAAA₁₆ patterns). Then the diagnostic performs a one-byte diagnostic write of all zeros, followed by a read block ID to verify that the data read back was correct. Next, a 256-byte buffer is written and verified by checking the block ID.

NOTE

Data is not transmitted to the external peripheral device. Only the internal data path within the coupler itself is tested.

Finally, a diagnostic read operation is performed that reads and verifies 256 bytes of alternating ones and zeros generated by the internal microcode in the FIPS device interface. The patterns generated are $FFFF_{16}$ and 0000_{16} .

The diagnostic then tests the stream mode logic by first performing a diagnostic read during stream mode. This test segment inputs 256 bytes of data, stores the data patterns in memory, and checks the block ID to see that it is 18C. The patterns stored in memory are:

1st word	0001
2nd word	0203
3rd word	0405
⋮	⋮
Last word	FEFF

A diagnostic write operation is then performed while in stream mode that generates the same patterns as above and the block ID is again checked for an 18C value. The receivers and transmitters are not actually checked during the stream mode test segments as no data is looped back; only the block IDs are checked.

Coupler Internal Diagnostic Error Codes

The coupler generates and returns to the PP various error codes detected by the internal diagnostics. The internal diagnostics are run during an autoload coupler microcode from PP function (0414), during an autoload coupler microcode from device function (06uu), during a channel interface diagnostics function (0070), and during a power-on or pushbutton master clear. For most internal coupler diagnostic errors, the coupler returns a general status of 5XXX to the PP, where XXX is the octal error code. An error code in hexadecimal is also sent to the coupler maintenance panel for display. The error codes generated for the maintenance panel display and for general status are described in table 6-1.

NOTE

Error codes 1301_{16} through 1373_{16} are derived from the CYBER channel trace tables. See appendix A for additional information. Also, refer to the tabulation following this listing for definitions of error codes ending with X. For example, 805X indicates error codes 8051 through 805F inclusive.

Table 6-1. Error Codes for Maintenance Board and General Status

Maintenance Board (Hexadecimal)	General Status (Octal)	Error Description
1000		Processor is stopped.
1301 - 130A		CYBER channel I/F diagnostic error, section 0.
1311, 1312		CYBER channel I/F diagnostic error, section 1.
1321 - 1325		CYBER channel I/F diagnostic error, section 2.
1331 - 1338		CYBER channel I/F diagnostic error, section 3.
1341 - 1348		CYBER channel I/F diagnostic error, section 4.
1351, 1352		CYBER channel I/F diagnostic error, section 5.
1361		CYBER channel I/F diagnostic error, section 6.
1371		Control package memory parity error.
1372		Memory parity error.
1373		Length not 0 after memory read to RF and RF read to memory write.
8000		Start ROM resident diagnostics, command test failed.
8001		Memory test for CYBER and channel I/F failure.
8002		ROM checksum failure, locations 8000 ₁₆ to 87FF ₁₆ .
8003		ROM checksum failure, locations 8800 ₁₆ to 8FFF ₁₆ .
8004		CYBER I/F interaction test, function time-out.
8005		CYBER I/F interaction test, memory parity error.
8006		CYBER I/F interaction test, control package parity error.
8007		CYBER I/F interaction test, data miscompare.
8040	5100	Equipment switch settings (SW1-2, SW1-3, and SW1-4 on A04 module of the coupler) do not indicate a valid equipment type.

(Continued)

Table 6-1. Error Codes for Maintenance Board and General Status (Continued)

Maintenance Board (Hexadecimal)	General Status (Octal)	Error Description
805X*	5121-5137	Normal end did not set in the ending status word after a load transfer registers function.
806X*	5141-5157	Normal end did not set in the ending status word after a read transfer registers function.
8070	5160	Transfer registers data miscompare.
807X*	5161-5177	Normal end did not set in the ending status word after a diagnostic write sequence.
8080	5200	Full/Empty counter is incorrect after a diagnostic write sequence.
808X*	5201-5217	Normal end did not set after a read block ID function.
8090	5220	Block ID is incorrect after a diagnostic write sequence.
809X*	5221-5237	Normal end did not set in the ending status word after a diagnostic read function.
80A0	5240	FIPS address is incorrect after a diagnostic write function.
80A8	5250	Diagnostic read pattern is incorrect.

* Hardware error codes ending in X indicate the following.

- 1 Write path parity error upper (1F09, bit 10 set)
- 2 Write path parity error lower (1F09, bit 2 set)
- 3 Memory parity error
- 4 Bus in parity error and read path parity error
- 5 Read path parity error
- 6 Bus out fault (1F08, bit 3 set)
- 7 Tag out fault upper (1F08, bit 4 set)
- 8 Tag out fault lower (1F08, bit 9 set)
- 9 Flag bit detected
- A Minimum block length not met
- B Select in received
- C No request in on poll sequence
- D Device address miscompare
- E Time-out on FIPS transfer
- F Not used

(Continued)

Table 6-1. Error Codes for Maintenance Board and General Status (Continued)

Maintenance Board (Hexadecimal)	General Status (Octal)	Error Description
80A9	5251	Transfer register error after a diagnostic read function.
80AA	5252	Block ID is wrong after a diagnostic read function.
80AB	5253	FIPS interface sequence did not complete.
80AC	5254	Data stream diagnostic read time-out.
80AD	5255	Data stream diagnostic write time-out.
80BX*	5261 - 5277	Data stream diagnostic read status is not normal end.
80C0	5300	Data stream diagnostic read block ID is wrong.
80CX*	5311 - 5327	Data stream diagnostic write status is not normal end.
80D8	5330	Data stream diagnostic write block ID is wrong.
8101	5401	System reset error occurred after checksum during autoloading from PP function.
8102	5402	CYBER interface status error occurred after an autoloading from PP function.
8103	5403	RAM checksum error occurred after autoloading.

* Hardware error codes ending in X indicate the following.

- 1 Write path parity error upper (1F09, bit 10 set)
- 2 Write path parity error lower (1F09, bit 2 set)
- 3 Memory parity error
- 4 Bus in parity error and read path parity error
- 5 Read path parity error
- 6 Bus out fault (1F08, bit 3 set)
- 7 Tag out fault upper (1F08, bit 4 set)
- 8 Tag out fault lower (1F08, bit 9 set)
- 9 Flag bit detected
- A Minimum block length not met
- B Select in received
- C No request in on poll sequence
- D Device address miscompare
- E Time-out on FIPS transfer
- F Not used

(Continued)

Table 6-1. Error Codes for Maintenance Board and General Status (Continued)

Maintenance Board (Hexadecimal)	General Status (Octal)	Error Description
8140	5404	RAM memory test error occurred before the autoloader from PP function started.
8141	5501	Seek or recalibrate sequence time-out from disk device.
8141	5101	Equipment switches set wrong.
8142	5502	Recalibrate or seek error from disk device.
8143	5503	Seek sequence ending status error from disk device.
8144	5504	Search error from disk device.
8145	5505	Read data error from disk device.
8147	5507	System reset sequence error from disk device.
8148	5110	Normal end not set in ending status after select sequence.
8148	5510	Search/read sequence time-out from disk device.
8149	5111	Normal end not set in ending status after load transfer registers.
814A	5112	Normal end not set in ending status after read transfer registers.
814B	5113	Transfer register data miscompare.
814C	5114	Normal end not set after diagnostic write sequence.
814F	5117	Full/empty count incorrect after diagnostic write.
8150	5120	SCU address incorrect after diagnostic write.
8151	5121	Normal end not set after read block ID.
8152	5122	Block ID wrong after diagnostic write.
8154	5124	Normal end not set after diagnostic read.
8156	5126	Diagnostic read data pattern incorrect.

(Continued)

Table 6-1. Error Codes for Maintenance Board and General Status *(Continued)*

Maintenance Board (Hexadecimal)	General Status (Octal)	Error Description
8157	5127	Transfer register error after diagnostic read.
8158	5130	Block ID wrong after diagnostic read.
816D	5155	SCU I/F sequence did not complete.
8200	5600	System reset sequence error.
8201	5601	Initial select/rewind sequence error.
8202	5602	Cannot locate controlware record error.
8203	5603	Input controlware record error.
8204	5604	RAM controlware checksum error.
8205	5605	Final select/rewind sequence error.
8800	0000	Normal completion of internal diagnostics. (ROM idle loop.)
8810	0000	Autoload from PP started.
8820	0000	Autoload from disk device started.
8840	0000	Autoload completed (ROM resident).
8888	0000	Autoload completed.

Coupler Down-Line Diagnostics

The following diagnostics (CLM, CCM, NDM, and NDP) are down-line loaded from the PP to the coupler. These diagnostics provide more extensive testing of the coupler than can be performed by the internal (self-test) diagnostics.

CLM - Diagnostic Loader/Monitor

CLM is the loader and monitor program for the down-line diagnostics. It is used to load, start, and monitor execution of these tests. The following restrictions apply.

- The test to be executed must be contained on the system file called "scratch" before a run command is given to CLM.
- Any test parameters must be entered before CLM is started or the test will execute using default parameters.

After CLM starts execution of a diagnostic test, the monitor checks the CCC memory locations containing the test status. All changes in the test status are checked by the monitor and made available to the user via the KL display, terminal display, or the print file. All errors detected during test execution due to I/O problems or hardware problems cause the test and the monitor to stop, and the error is reported. Two types of errors are possible: errors detected by CLM such as channel problems, no test on the system scratch file, or parameter problems; and errors detected by the test itself. Depending on the type of error, the user may or may not be able to continue test execution.

The various error messages reported by CLM are as follows.

- CLM00 - Parameter error detected.
- Processor Error on Master Clear - A compare error was detected when coupler memory locations 4 through F were read. This indicates that an error occurred during the master clear process. The user can continue test execution at own risk. The contents of addresses 4 through F are displayed during this error.
- TTTMM Stopped on Error - This message indicates that a test error has occurred and that the test has stopped. TTTMM is the name of the test/module that stopped.

- **Error MMMMMMMMMMMMMMMMMMMMMM** - This indicates that the test has stopped due to an error detected by the test. M...M is the test error message. Error message format is as follows.

EC=EEEE ECNT=CCCC ICNT=IIII

ADDR=AAAA EXP=EXXX ACT=RRRR

Hardware Status=HHHH

EEEE Error code.

- E0002 Channel Parity Error. The channel detected a parity error while data was being transferred across the CYBER channel.
- E0003 Test Loaded Incorrectly. The one-word verify process failed. This indicates that the complete test does not reside in CCC memory.
- E0004 Test Not in System File. Before the test is downloaded to the coupler, the loader checks to see if the coupler test was written into the system "scratch" file by looking for the 77 header table. This error message is reported if the 77 header table cannot be found.
- E0005 In-line Diagnostic Error. Prior to downloading a test to the coupler, the in-line diagnostics are executed. If the diagnostics complete properly, but the general status received is not equal to zero, then this error is reported.

CCCC Error count.
 IIII Iteration count.
 AAAA Coupler address where failure occurred.
 EXXX Expected contents of failing address.
 RRRR Actual contents of failing address.
 HHHH Coupler hardware status.

- **Clear RM to Terminate Test** - This message alerts the user that the repeat module switch must be turned off before the test is terminated. If the RM switch is left on, the loader/monitor module keeps repeating.
- **CCC In-Line Failure - No Response Within 500 ms** - The in-line diagnostics were invoked by sending a zero length autoloader command to the coupler and no response to the function was received within 500 ms. This indicates that the coupler is in a hung condition.

CCM - CCC Memory Test

CCM is a memory test for the coupler. The test resides in a peripheral processor and tests the memory of the coupler. The test does not use the processor in the coupler. During execution, the processor is stopped. The execution time for this test is approximately 50 s.



This test destroys the coupler microcode in the coupler being tested.

This test consists of the following test modules.

Module	Description
CCM00	Tests the parameter words entered and verifies that they are valid for the coupler being tested.
CCM01	Verifies the DMA read and write data paths to memory by passing data to and from coupler memory through use of microcode functions.
CCM02	Tests the coupler memory using data patterns of all ones and all zeros.
CCM03	Tests the coupler memory using data patterns of 5555 ₁₆ and AAAA ₁₆ .
CCM04	Tests the coupler memory using an 8-bit sliding-zero data pattern (using FDFD, FBFB, F7F7, EFEF, DFDF, BFBF, and 7F7F ₁₆ data patterns).
CCM05	Tests the coupler memory using an 8-bit sliding-one data pattern (Using 0101, 0202, 0404, 0808, 1010, 2020, 4040, and 8080 ₁₆ data patterns).
CCM06	Tests the addressing capabilities of the coupler memory.
CCM07	Tests the coupler memory using random data patterns.

The following display formats are used by CCM to report errors to the user.

● Parameter Entry Errors:

```
CCM - CCC Memory Test
CCMNN - (M.....T)
CCMNN Suspected Parameter Error
(E.....D)
P0 - P4  PPPP PPPP PPPP PPPP PPPP
P5 - P9  PPPP PPPP PPPP PPPP PPPP

NN          Module number
M.....T    Module title
E.....D    Description of the error
PPPP        Contents of the parameter word (P0 and P2 through P9 are
              not used. P1 = 0000 = Default value for 16K memory size.
              P1 = 0001 = 16K)
```

- Product Overlay Errors:

CCM - CCC Memory Test
CCMNN - (M.....T)

CCMNN Aborted on (C.....M)
Last function = FFFFB WT = WWWB
CCMNN EXXXXB LYYB (E.....M)

NN	Module number
M.....T	Module title
C.....M	Command on which the abort occurred
FFFF	Last function issued to the coupler
WWWB	Words transferred during last data transfer
XXXX	The error code in octal
YYY	The EA register when the error occurred
E.....M	Verbal description of the error code

- Memory Data Errors:

CCM - CCC Memory Test
CCMNN - (M.....T)
CCMNN Aborted on (C.....M)
CCMNN EXXXXB LYYB (E.....M)

ADRS	EXP.	ACT.	DIF. (hexadecimal values)
AAAA	BBBB	CCCC	DDDD
AAAA	BBBB	CCCC	DDDD
AAAA	BBBB	CCCC	DDDD
AAAA	BBBB	CCCC	DDDD
AAAA	BBBB	CCCC	DDDD
AAAA	BBBB	CCCC	DDDD
AAAA	BBBB	CCCC	DDDD
AAAA	BBBB	CCCC	DDDD

NN	Module number
M.....T	Module title
C.....M	Command on which the abort occurred
XXXX	The error code in octal
YYY	The EA register when the error occurred
E.....M	Verbal description of the error code
AAAA	The failing address in the coupler memory
BBBB	The expected contents of the memory location
CCCC	The actual contents of the memory location
DDDD	The logical difference of BBBB and CCCC

NDM - CCC Memory Test

NDM is a memory data test for the coupler. It is designed to detect failing bits and failing addresses in the coupler memory. The diagnostic is loaded into the coupler memory and checks memory through use of the processor access. The NDM diagnostic for the coupler consists of seven test modules that get progressively more complex. These are described as follows.

▲WARNING

This test destroys the down-line loaded coupler microcode in the coupler being tested.

A memory parity error causes the processor in the coupler to stop. The processor status is stored in memory locations 4 through F_{16} in the processor memory.

Module	Description
Module 0	Quick look test. Tests the low memory locations. Addresses are read only; no write operations take place.
Module 1	Write and read data test. Checks for data and parity errors. The following data patterns are written throughout memory, then read. All 0's, all 1's, all 5's, and all A's.
Module 2	Data equal address test. Loads addresses to be tested with data that equals the address value. These addresses are then read and checked for a miscompare.
Module 3	Sliding one and zero test. Takes the starting address and sets bit 0. The data is then complemented for that address, and tested again. A right shift of one is performed and that address is tested again. This process continues until all bits in the address have been tested. This sequence is repeated for each address tested.
Module 4	Marching data test. Loads all memory to be tested with zeros. Then each address is read and $FFFF_{16}$ is written in that address. After all addresses have had this operation performed, the $FFFF_{16}$ data pattern is read and zeros are then written. Any data miscompares are reported.
Module 5	Relocatable test. Takes the portion of the NDM test that starts at address 200_{16} (excludes the low-memory addresses) and relocates it to upper memory starting at address 3000_{16} . Then a marching data test is run on addresses 200_{16} through $2FFF_{16}$. When testing is complete, NDM is relocated back to its original address locations.
Module 6	Random data test. Condition 1 generates a random data pattern for each address. When all of memory is written, each address is then read and a compare is performed to see that the random number read from each address is the same as the number generated for it. Condition 2 generates a random address, and then a random number is written in that address. This address is then read and verified.

The following error codes and messages are reported.

Error Code	Error Message
01	Data miscompare error. The data pattern written does not equal the data read.
02	Data-not-equal-to-address error. The data read from a location did not equal the address of that location.
03	SCDT miscompare error. A sliding bit in an address being written and then complemented had a miscompare.
04	MDT miscompare error. A machine data test where complemented data (zeros and ones) was written and then read from an address location and a data miscompare occurred.
05	Random data error. The random data written in an address did not compare with the data read from that address.
06	Random addressing data error. The random data written at a random address had a miscompare when read back.
07	Memory size error. The memory size set in parameter P1 is not valid. Accepted parameters are: 0 or 1 = 16K, 2 = 24K, 3 = 32K, 4 = 40K, 5 = 48K, 6 = 56K, 7 = 64K.

NDP - CCC Processor Test

NDP is a processor instruction test for the processor contained in the coupler. It is designed to detect failing instructions in the processor of the coupler. NDP contains a quick-look test and 63 test modules. The quick-look test is a confidence test of the coupler processor instructions. It is executed before any of the 63 test modules. The module test sequence is structured to test the simplest instructions first, and then gradually test the more complex instructions. A fixed set of operands is used to test some parts of the coupler processor such as the ALU and shift network. The code conversion instruction uses a canned set of random operands to test this instruction.

If NDP detects an error during execution of the quick-look diagnostic or if the processor detects a memory parity error, the processor is stopped and the status conditions are stored in locations 4 through F_{16} of the processor memory. The monitor program (CLM) detects the quick-look error condition and displays the contents of locations 4 through F_{16} .

Refer to the CLM loader/monitor diagnostic description for the format used for error messages.

Peripheral Processor Diagnostic Functions

The following seven PP diagnostic functions are decoded by the CYBER channel interface independent of processor instructions, and are not part of the microcode or firmware. The operation (Op) codes, in octal, are described as follows.

- X5XX - Load Address and Length
- X701 - Read
- X702 - Write
- X704 - Status
- X710 - Stop
- X720 - Go
- X740 - Master Clear

X5XX - Load Address and Length

This function allows the PP to activate the channel and send one or two data words. The lower 4 bits (XX) of the function are loaded into the upper 4 bits of the 16-bit address register. The first word sent is loaded into the lower 12 bits of the address register to complete its loading. The second word sent is loaded into the lower 12 bits of the 16-bit length register while the upper 4 bits are zero-filled. The channel interface responds only to the first two words sent and a hung channel may result if the PP attempts to send additional words. This function also clears register file 1 (status).

X701 - Read

This function allows the PP to activate the channel and input the length count times two words. The upper 8 bits of the 16-bit word referenced by the address register are transferred as the lower 8 bits of the first 12-bit channel word while the upper 4 bits are zero-filled. The lower 8 bits of the 16-bit word are transferred in the same manner as the upper 8 bits. The address is incremented, the length decremented, and the PP input process continues until the CYBER channel interface deactivates the channel when the length equals zero. The PP may terminate the operation early if desired. The address and length must be loaded prior to sending this function in order for data to be valid. A check for memory parity errors is made at the end of the data transfer and the results are logged in register file 1 (status).

X702 - Write

This function allows the PP to output the desired number of words. Only the address register is loaded by diagnostic function X5XX, while the length register is not used. The lower 8 bits of the first 12-bit word received by the coupler are loaded into the upper 8 bits of a holding register. The lower 8 bits of the second 12-bit word are loaded into the lower 8 bits of the holding register. The contents of the holding register are then sent to memory. This process continues for additional words sent by the PP. The word transfer is terminated by an inactive signal from the channel. The address register must be loaded prior to every X702 function received by the coupler to ensure that data is written into the correct memory location. If an odd number of words are received, the lower 8 bits of the last word sent to memory are zero-filled.

X704 - Status

This function allows the PP to activate the channel and input one word of status from register file 1. The CYBER channel interface deactivates the channel after it sends the status word. This word contains the following status bits.

NOTE

Bit 11 is the most significant bit.

Bit	Description
Bit 11	Normal end
Bit 10	Channel parity error
Bit 9	Memory parity error
Bit 8	Deadman timeout
Bit 7	Control package parity error
Bit 6	Transfer indicator
Bit 5	Character fill
Bit 4	Not used
Bit 3	Length equals zero
Bit 2	DMA complete
Bit 1	Processor running
Bit 0	Processor abnormal

Bits 5 through 11 reflect the last status sent to memory location 0024₁₆ following a processor operation. Diagnostic function X5XX clears bits 5 through 11. Only bits 8 through 10 of these bits are valid for diagnostic purposes as the others are processor-controlled bits. Bits 0 through 3 are dynamic status bits which indicate the state of the logic at the time the function is received.

X710 - Stop

This function causes the processor to stop running.

X720 - Go

This function allows the processor to start running.

X740 - Master Clear

This function clears processor and device interface logic.

CYBER Channel Interface Diagnostic Functions

The CYBER channel interface has two separate paths through which PP data can reach the coupler memory. One path uses the Universal Device Interface (UDI) module and assembles data under microcode control. The other path uses Direct Memory Access (DMA) to assemble data under hardware control. The following functions are used to test these paths. The octal function codes are not given as they differ for the various devices that may be attached to the coupler. Refer to the specific subsystem user's guide for the applicable function codes.

- UDI Read
- UDI Write
- DMA Read
- DMA Write

UDI Read

The UDI read function allows the PP to read 322 12-bit words from the coupler memory. This function uses the same hardware path as the status functions. The coupler outputs the 12 rightmost bits of each 16-bit memory word. It can be used to read the data previously written with the UDI write function.

UDI Write

The UDI write function allows the PP to write 322 12-bit words into the coupler memory. This function uses the same hardware as functions that send parameters. The 12-bit channel word is stored in the 12 rightmost bits of the 16-bit memory word. General status is 5000 if there is a channel parity error or less than 322 words are received by the coupler. A general status of zero indicates the function completed without error.

DMA Read

The DMA read function allows the PP to read 322 12-bit words from the coupler memory. It uses the same hardware path as the read function (0004). The 322 12-bit words are stored in the 8 leftmost bits of the 16-bit words in the 483-word coupler memory buffer. This buffer contains the last record written to the disk, read from the disk, or written by the DMA write function. A general status of zero indicates the function completed without error.

DMA Write

The DMA write function allows the PP to write 322 12-bit words into the coupler memory. It uses the same hardware path as the write function (0005). The 322 12-bit words are stored in the 8 leftmost bits of the 16-bit words in the 483-word coupler memory buffer. A general status of zero indicates the function completed without error.

0070-FIPS Device I/F Diagnostics Function

This function tests the FIPS device interface logic circuits. It allows the PP to run the same FIPS device interface diagnostics run during a full-autoload coupler microcode from PP function (0414). The diagnostic tests include loading and reading the transfer registers, loading and reading conversion tables, transmitting fixed data patterns from memory to the transmitters, and transmitting fixed data patterns from the receivers to memory. If the diagnostic executes without error, the general status returned to the PP is zero. If an error is detected, the general status is 5XXX, where XXX is an error code. (Refer to coupler internal diagnostic error codes described earlier.)

CYBER Channel Parity Error Detection and Processing

CYBER channel parity errors are detected on all PP functions and all PP read/write operations to the coupler. The types of channel parity errors and their methods of processing are described in the following paragraphs.

Channel Parity Error on Function from PP

The coupler does not reply to a function from the PP having a parity error. The PP must time out the function to avoid hanging the channel. After the time-out, the PP should disconnect the channel and resend the function to the coupler. The operation must be aborted if parity errors continue.

Parity Error on PP Write

The PP completes the write operation in a normal manner after detection of a parity error on a PP write function. The PP should then send a general status function (0012) to the coupler. The coupler microcode prepares the status words in its memory and a general status of 5000 is returned to the PP. The PP should then send an extended detailed status function (0023) to the coupler and the coupler responds with bit 6 of detailed status word 18 set to indicate a write parity error. The PP should resend the write function and parameters or data to recover from the parity error. The operation must be aborted if parity errors continue.

NOTE

If parity errors occur during general or extended detailed status functions, refer to the Channel Parity Error on Function from PP and Parity Error on PP Read (Parameters or Data) paragraphs.

Parity Error on PP Read (Parameters or Data)

Prior to sending the next function, the PP should test the appropriate bit in the status and control register after the data block input. The coupler microcode does not detect a parity error on a PP read, and only general status indicates a coupler error. The PP must take one of the following actions after detecting the parity error.

- Resend the function and reread the parameters or data.
- Reseek and read the record.
- Reseek and read the block of records.
- Abort the operation if parity errors continue.

Deadman Timer Feature

The coupler hardware incorporates a deadman timeout feature that prevents the PP channel from hanging for an extended period of time. The deadman timer is enabled for all functions that transfer data between the PP and the coupler. Each time a Full or Empty signal is transferred across the channel, the deadman timer is reset to zero and the time-out period is reinitiated. When the PP deactivates the channel, the deadman timer is set to zero. If a data transfer hangs up, a time-out period of 7 to 10 seconds expires and an Inactive signal is sent to the PP.

For read/write functions to the disk, DMA write operations, and DMA read operations, the microcode prevents deadman timeouts. If the data transfer does not complete or the channel is not deactivated for these functions, the microcode deactivates the channel. General and detailed status describe the error.

For the remaining functions that transfer words between the PP and the coupler (connect, seek, format pack, and UDI write), the deadman timer is used. A general status of 5000 and a deadman timeout status in detailed status word 18 is returned for these functions if the deadman timer unhangs the channel.

Coupler Memory Locations

The following coupler memory locations provide pertinent status and operating information that can be examined by the customer engineer during troubleshooting. Refer to the CYBER Channel Coupler 19404-1/2/3/10/11/12 Hardware Reference Manual listed in About This Manual for additional information on these addresses.

Processor Addresses

Hex Address	Contents
0004	Read Data
0005	Current Instruction
0006	P Register
0007	A Register
0008	B1 Register
0009	B2 Register
000A	S1 Register
000B	S2 Register
000C	S3 Register
000D	S4 Register
000E	Status

CYBER Channel I/F Control Package Addresses

Hex Address	Contents
0020	Op Code
0021	Address
0022	Length
0023	Function
0024	Status
0025	Coupler Identification
NPAG	

FIPS Device I/F Control Package Addresses

Hex Address	Contents
0028	Starting Address of FIPS Control Sequence (1C00)
0029	Device Address
002A	Control Sequence Ending Status
002B	Control Sequence Execution Address
002C	Request In
002D	Ending Status for Aborted FIPS Transfer
002E	Delay Count
2000	Buffer Starting Address

Coupler Maintenance Board

The maintenance board at location A14 provides a means for reading memory locations from either the 19404-1/2/10/11 standard or 19404-3/12 optional coupler. To use the maintenance board switches and indicators shown in figure 2-2, set the option-A/normal/option-B switch to NORMAL, then set the address select switches to the desired memory address to be read. Next, place the option-A/normal/option-B switch to either OPTION-A (for 19404-1/2/10/11) or OPTION-B (for 19404-3/12) to read the contents of the specified memory address. This procedure will halt the processor, then the memory contents will appear on the 16-LED memory display in hexadecimal notation. Successive memory locations may be read by setting the desired addresses on the address select switches. Return the selector switch to the ON-LINE position when through. This restarts the processor.

The NORMAL position of the option-A/normal/option-B switch allows the maintenance board to be a memory mapped display shared by either the standard or optional coupler. That is, either coupler can write to the display. However, the standard coupler (19404-1/2/10/11) has priority over the optional coupler (19404-3/12).

The maintenance board also contains the four following LED indicators.

- DATA PARITY ERROR; when lit, indicates a parity error.
- NORMAL MODE; when lit, indicates the standard or optional coupler is selected in on-line mode when the option-A/normal/option-B switch is set to NORMAL.
- OPTION-A; when lit, indicates the standard coupler writes to the memory display.
- OPTION-B; when lit, indicates the optional coupler writes to the memory display.

If either the standard or optional coupler writes to the memory display during normal mode, the corresponding LED lights for the last coupler that received write data.

HPA/MALET/DEMOT Execution

The following paragraphs provide instructions on how to run HPA (Hardware Performance Analyzer) in order to obtain equipment and media performance reports, and how to execute diagnostics under MALET (Maintenance Application Language for Equipment Testing) and DEMOT (Diagnostic Executive Monitor for Offline Testing). MALET is part of the Concurrent Maintenance Library (CML) and DEMOT is part of the Maintenance Software Library (MSL).

HPA Execution

HPA runs under the network operating system (NOS). The following steps provide a rudimentary method for running HPA to obtain an intervention report. Refer to the HPA User Reference Manual listed in About This Manual for complete HPA information.

- ___ 1. Execute HPA by typing in the following NOS commands.

```
X.DIS.
USER,username,password,family.
CHARGE,account parameters.
GETLOG.
NORM.
HPA.
*
```

- ___ 2. Examine the HPA output listing for a system-related intervention report.

- ___ 3. Use the PP channel/equipment/drive numbers from the intervention report when running diagnostics if the equipment status table (EST) ordinal for the equipment is not known.

MALET/DEMOT Execution

MALET is a computer maintenance language that runs under NOS. The coupler down-line diagnostics can be executed on-line under MALET. DEMOT provides similar capabilities in the off-line environment. The following paragraphs describe typical methods of placing MALET and DEMOT in execution and assigning a drive for testing. The two on-line MALET procedures require that the following conditions be satisfied before starting. Refer to the CML Reference Manual listed in About This Manual for additional MALET information.

- Before executing MALET, place the operating system in engineering mode by typing the following NOS commands at the system console.

```
UNLOCK.
ENGR. or ENABLE, ENGR.
LOCK.
```

When diagnostic activity is complete, the operating system should be taken out of engineering mode by retyping the appropriate commands listed above.

- MALET requires a GO,jsn command from the operator before executing any of the following coupler diagnostics: CLM, CCM, NDM, or NDP.
- On some sites, access to individual diagnostics that run under MALET requires that the user identification at run time be identical to the identification used when the diagnostics were stored.

*MALET (On-Line) Execution from Remote Terminal***NOTE**

This procedure assumes that the coupler diagnostics are already stored on the system disk. If not, refer to the Concurrent Maintenance Library (CML) Reference Manual listed in About This Manual for information necessary to store the diagnostics.

Perform the following steps to execute on-line diagnostics from a remote terminal using MALET.

- ___ 1. Telephone the computer site and explain that you will be running MALET diagnostics on the coupler. Ask the computer operator to place the operating system in engineering mode and to issue a GO,jsn command at your job's control point when requested by console message.
- ___ 2. Log in to IAF (NOS) according to site-determined procedure.
- ___ 3. Type one of the following sets of commands.
 - ___ a. To run NDM or NDP, type all of the following commands.


```
ATTACH,NDP. (or NDM)
ATTACH,RFILE=CLM.
MALET(T=line length)
ASSIGN,EST=est,AL=3 (when the equipment has an EST entry) or
ASSIGN,EST=NO,CH=ch,EQ=0,UN=un,AL=10,DC=dc (when equipment has no
EST entry)
WAIT. (operator must give a Go)
P,XXXXX. (depending on the test)
SCRATCH=NDP. (or NDM)
R,CLM.
```
 - ___ b. To run CCM, type all of the following commands.


```
ATTACH,RFILE=CCM.
MALET(T=line length)
ASSIGN,EST=est,AL=3 (when the equipment has an EST entry) or
ASSIGN,EST=NO,CH=ch,EQ=0,UN=un,AL=10,DC=dc (when equipment has no
EST entry)
WAIT. (operator must give a Go)
P,XXXXX. (depending on the test)
R,CCM.
```

*MALET (On-Line) Execution from Local Console***NOTE**

This procedure assumes that the coupler diagnostics are already stored on the system disk. If not, refer to the Concurrent Maintenance Library (CML) Reference Manual listed in About This Manual for information necessary to store the diagnostics.

Perform the following steps to execute the NDM and NDP on-line diagnostics from the local system console using MALET. (This procedure runs both tests).

___ 1. Type in the following NOS entry for the applicable procedure.

___ a. To prepare the test file:

```
X.DIS.
user#.
GET,NDP,NDM. (indirect file) or ATTACH,NDP,NDM. (direct file)
GET,RFILE=CLM. (indirect file) or ATTACH,RFILE=CLM (direct file)
MALET,KL.
DROP.
K,cp#. (control point number in NOS 1) or K,JSN. (NOS 2)
K.A,EST=40,AL=5,DC=XX.
```

___ b. To run the tests:

```
K.SCRATCH=NDP.
K.R,NLM.
```

___ c. When NDP completes, enter:

```
K.SCRATCH=NDP.
K.R,NLM.
```

Perform the following steps to execute the CCM on-line diagnostics from the local system console using MALET. Type in the following NOS entry.

```
X.DIS.
user#.
GET,RFILE=CCM. (indirect file) or ATTACH,RFILE=CCM. (direct file)
MALET,KL.
DROP.
K,cp#. (control point number in NOS 1) or K,JSN. (NOS 2)
K.A,EST=40,AL=5,DC=dc.
cp#.GO. (NOS 1) or GO,JSN. (NOS 2)
K.R,CCM.
```

DEMOT (Off-Line) Execution from Local Console

Perform the following steps to execute diagnostics off-line using DEMOT. Refer to the MSL Reference Manual listed in the preface for additional DEMOT information.

- ___ 1. Mount MSL tape on tape unit.

NOTE

When used with a 66X tape subsystem, this procedure assumes that tape microcode is loaded and intact. If not, perform coldstart procedure described in the MSL Offline Maintenance Software Library Reference Manual listed in About This Manual.

- ___ 2. Press the deadstart button under console display.
- ___ 3. Check default system configuration assignments on initial display.
 - ___ a. If communication channel assignments (ordinals 6, 7, and 8) conflict with disk channel(s), change system configuration by typing n. entry. For example, to change ordinal 6 to channel 05, enter:

6.05.
 - ___ b. MSL may be transferred from tape to disk at this time using one of the tape-to-disk utilities (TDX,TDY,TDZ) described in the MSL Reference Manual listed in About This Manual. The tape-to-disk MSL transfer takes approximately 20 minutes.

When the transfer completes, press the deadstart button under console display and then change system configuration ordinals 11 through 17 to enable common maintenance software executive (CMSE) loading from the appropriate drive.
- ___ 4. Press carriage return (CR) to load CMSE.
- ___ 5. Enter:

*OV,2000.

to place the CMSE overlay in central memory.
- ___ 6. If microcode is already loaded in the coupler, go to step 7; otherwise, load microcode as follows.

CW;name,ch. (name = CDC microcode deck name from disk, and ch = channel number of coupler)

___ 7. Enter one of the following command strings to bring up DEMOT from disk or tape.

___ a. Disk:

```
*DP,OUTPUT
CP*4,MCX,0,5
CP*5,MLD,0,5
RU*4,100
SQ*77,1,4      (Needed only when using CMSE command buffers)
PP*4
DEMOT
RU*5,100
SQ*77,1,4      (Needed only when using CMSE command buffers)
```

___ b. Tape:

```
CP*4,MCX,0,5
CP*5,MLD,0,5
RU*4,101
SQ*77,1,4      (Needed only when using CMSE command buffers)
PP*4
DEMOT
RU*5,101
```

___ 8. Enter:

ASSIGN,CH=ch,UN=un,AL=20,DC=dc.

to assign a coupler for testing.

___ 9. Enter:

PARAM,PX=YYYY.

as required.

___ 10. Enter:

RUN,CCM.

Storing Controlware

The two methods for storing microcode as a permanent file on the system disk are:

- Extracting microcode from the operating system tape.
- Copying microcode from the MAXxx Install Tape.

Execute the following to extract microcode from the operating system deadstart tape.

```
NOS:      jobname,T100.
          USER,username,password,family.
          CHARGE,account parameters.
          REQUEST,file,NT,D=PE,F=I,LB=KU.
          DEFINE,MAXxx/CT=PU,M=R.
          GTR,file,MAXxx.PPU/ISD.
          REWIND,file.
          DEFINE, COS.
          GTR,file,COS.PPU/CMD.
          6/7/8/9
```

Execute the following to copy microcode from the MAXxx Install Tape.

```
NOS:      jobname,T100.
          USER,username,password,family.
          CHARGE,account parameters.
          REQUEST,file,D=PE,F=SI,LB=KU.
          DEFINE,MAXxx/M=W.
          COPYBR,file,MAXxx.
```


100%

6

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Explanation of SAM Format

The Structured Analysis Method (SAM) is used in this manual to present troubleshooting information in a logical sequence of maintenance tasks. Figure 7-1 illustrates the basic SAM format. The SAM poses questions that, when answered, lead the user to a corrective action (or sequence of actions) to be performed. The corrective actions are organized such that the action most likely to fix the problem is listed first. If more than one action is equally probable to correct the malfunction, the action requiring the least amount of time is listed first. The purpose of the SAM as well as any applicable assumptions or advisory information is provided at the beginning of the SAM document.

To interpret a SAM, start at the top of the first page and determine the response for the first question posed. Then follow the appropriate line beneath the Y or N response. Answer the next question, and so on, until the action numbers are reached. Perform the action(s) listed in that column in numerical order to correct the malfunction. A line under an action number indicates that it is the last corrective action to be performed for that particular malfunction.

Organization of SAM and Procedures

The three separate chapters used for the SAMs and the remove/replace/adjust procedures are: chapter 7 for the SAMs, chapter 8 for 19404-1/10 procedures, and chapter 9 for 19404-2/11 procedures.

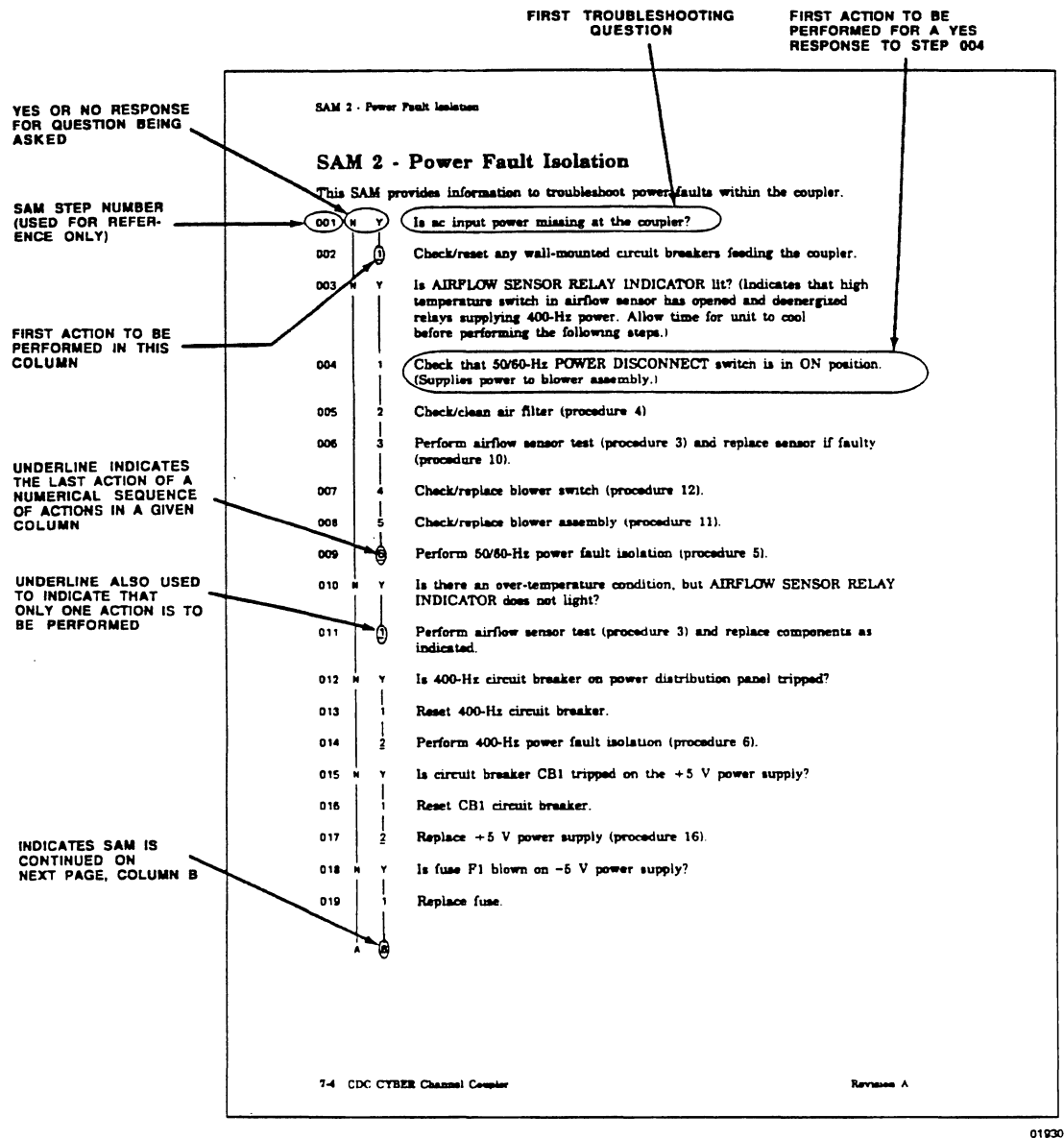


Figure 7-1. SAM Format Example

SAM 1 - Entry SAM for Coupler Problems

This SAM is the first-level, or entry-level, SAM for isolating coupler problems. It provides information to direct the customer engineer to the appropriate SAM that should be performed for detailed fault isolation.

001	N	Y	Does the coupler fail to power up correctly?
002		1	Go to SAM 2, Power Fault Isolation.
003	N	Y	Do the internal coupler diagnostics fail to execute following a coupler power application or coupler master clear?
004		1	Replace PC boards in the following order: Chassis locations A06 and A05 (19404-1/2/10/11) or A20 and A19 (19404-3/12).
005	N	Y	Is there an internal coupler diagnostic test error? (Following a coupler power application or coupler master clear.)
006		1	Go to SAM 3, Internal Diagnostic and Trace Table Errors.
007	N	Y	Is there a coupler down-line diagnostic test error? (CLM, CCM, NDM, and NDP diagnostic tests.)
008		1	Go to the applicable SAM for the particular down-line diagnostic test as follows: SAM 4 for test CLM, SAM 5 for test CCM, SAM 6 for test NDM, and SAM 7 for test NDP.
009	N	Y	Is there a coupler autoloader problem?
010		1	Check I/O cables between coupler and PP.
011		2	Verify that the correct microcode identification number and revision number are stored in the following RAM locations of coupler. 003C ₁₆ last four digits of microcode ID (in hexadecimal) 003D ₁₆ microcode revision number (in hexadecimal)
012		3	Go to SAM 3 and execute the internal diagnostics for additional error isolation.
013		1	Go to the beginning of this SAM and recheck all conditions to see if any fit the symptoms present. If not, try running the internal diagnostics and/or the down-line diagnostics to aid in isolating the problem. Refer to the Maintenance Aids portion of section 6 for a description of the various coupler diagnostic tests available.

SAM 2.1 - Power Fault Isolation (19404-1/10 CCC)

This SAM provides information to troubleshoot power faults within a 19404-1 or 19404-10 CCC.

001	N	Y	Is ac input power missing at the coupler?
002		<u>1</u>	Check/reset any wall-mounted circuit breakers feeding the coupler.
003	N	Y	Is AIRFLOW SENSOR RELAY INDICATOR lit? (Indicates that high temperature switch in airflow sensor has opened and deenergized relays supplying 400-Hz power. Allow time for unit to cool before performing the following steps.)
004		<u>1</u>	Check that 50/60-Hz POWER DISCONNECT switch is in ON position. (Supplies power to blower assembly.)
005		<u>2</u>	Check/clean air filter (procedure 4).
006		<u>3</u>	Perform airflow sensor test (procedure 3) and replace sensor if faulty (procedure 10).
007		<u>4</u>	Check/replace blower switch (procedure 12).
008		<u>5</u>	Check/replace blower assembly (procedure 11).
009		<u>6</u>	Perform 50/60-Hz power fault isolation (procedure 5).
010	N	Y	Is there an over-temperature condition, but AIRFLOW SENSOR RELAY INDICATOR does not light?
011		<u>1</u>	Perform airflow sensor test (procedure 3) and replace components as indicated.
012	N	Y	Is 400-Hz circuit breaker on power distribution panel tripped?
013		<u>1</u>	Reset 400-Hz circuit breaker.
014		<u>2</u>	Perform 400-Hz power fault isolation (procedure 6).
015	N	Y	Is circuit breaker CB1 tripped on the +5 V power supply?
016		<u>1</u>	Reset CB1 circuit breaker.
017		<u>2</u>	Replace +5 V power supply (procedure 16).
018	N	Y	Is fuse F1 blown on -5 V power supply?
019		<u>1</u>	Replace fuse.
	A	B	

	A	B	
020		<u>2</u>	Replace -5 V power supply (procedure 16).
021	N	Y	Does percentage meter pointer remain at left side of scale when measuring either +5 V or -5 V?
022		<u>1</u>	Perform 400-Hz power fault isolation (procedure 6).
023	N	Y	Is TEST EQUIPMENT circuit breaker (CB2) tripped on power distribution panel?
024		<u>1</u>	Unplug any power cords plugged into convenience outlet and reset circuit breaker CB2. (External equipment may be drawing more than 7 A.)
	<u>1</u>		For other power problems, refer to the power distribution diagram in chapter 5, and troubleshoot accordingly.

SAM 2.2 - Power Fault Isolation (19404-2/11 CCC)

This SAM provides information to troubleshoot power faults within a 19404-2 or 19404-11 CCC.

001	N	Y	Is ac input power missing at the coupler?
002		1	Check/reset wall-mounted circuit breaker feeding the coupler.
003	N	Y	Is neither the power supply, nor the blower operating?
004		1	Perform 50/60 Hz power fault isolation (procedure 4.1; section 9).
005	N	Y	Is the blower operating, but the power supply is not?
006		1	Perform 50/60 Hz power fault isolation (procedure 4.2; section 9).
007	N	Y	Is the power supply operating, but the blower is not?
008		1	Perform 50/60 Hz power fault isolation (procedure 4.3; section 9).
009	1		Refer to the power distribution diagrams in section 5 and troubleshoot accordingly.

SAM 3 - Internal Diagnostic and Trace Table Errors

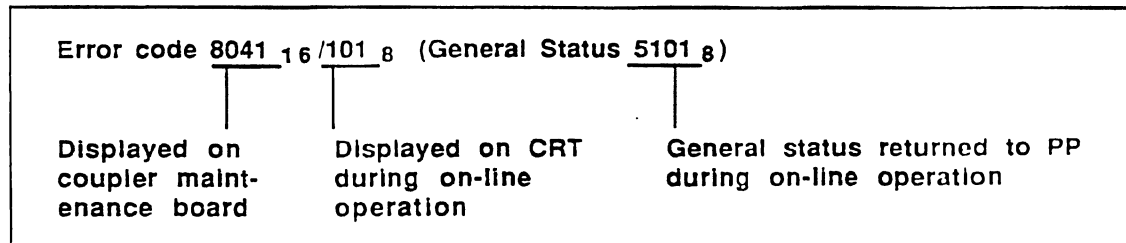
This SAM is for isolating errors detected by the internal diagnostics and the CYBER channel microcode trace tables of the coupler. The internal diagnostics can be run either off-line or on-line. Refer to section 6 for descriptions of the various internal diagnostic tests. Also refer to appendix A for information on the CYBER channel trace tables, to section 2 for a description of the diagnostic LEDS contained on the PC boards, and to procedure 23 in chapter 8 for logic card replacement information.

NOTE

To run the internal coupler diagnostics off-line, perform the following steps. (If CYBER channel I/O cables are not connected, the 10-MHz clock is not present; therefore, remove PC board at location 01 in order to run the diagnostics. Note that the CYBER channel logic is not tested with the PC board removed.)

1. Place OPTION-A, NORMAL, OPTION-B switch on coupler maintenance board to NORMAL position.
2. Press pushbutton MASTER CLEAR switch on PC board at location A04 (19404-1/2/10/11) or A18 (19404-3/12). (Or apply power to coupler per procedure 1.)
3. Observe 16-LED memory display on maintenance board for a detected error code or a successful completion code of 8800_{16} . (8800_{16} indicates successful completion only if no LEDS remain lit on PC boards.)

The SAM format for the error code information is as follows.



M01921

001	N	Y	Error code 1000_{16} displayed? (Processor is stopped.)
002		1	Verify that the OPTION-A, NORMAL, OPTION-B switch on coupler maintenance board is in the NORMAL position.
	A	B	

	A	B	
003		<u>2</u>	Replace PC boards in the following order: Chassis locations A05 and A06 (19404-1/2/10/11) or A19 and A20 (19404-3/12).
004	N	Y	Error code of 1101 ₁₆ through 1106 ₁₆ displayed? (Derived from the CYBER channel trace tables; see appendix A.)
005		<u>1</u>	Replace PC boards in the following order: Chassis locations A03, A02, A04, and A01 (19404-1/2/10/11) or A17, A16, A18, and A15 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) may require tuning; refer to Clock Tuning Procedure in section 3.)
006	N	Y	Error code of 1301 ₁₆ through 1348 ₁₆ displayed? (Derived from the CYBER channel trace tables; see appendix A.)
007		<u>1</u>	Replace PC boards in the following order: Chassis locations A03, A02, A04, and A01 (19404-1/2/10/11) or A17, A16, A18, and A15 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) may require tuning; refer to section 3.)
008	N	Y	Error code 8000 ₁₆ displayed?
009		<u>1</u>	Replace PC boards in the following order: Chassis locations A05 and A06 (19404-1/2/10/11) or A19 and A20 (19404-3/12).
010	N	Y	Error code 8001 ₁₆ displayed?
011		<u>1</u>	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
012	N	Y	Error code 8002 ₁₆ displayed?
013		<u>1</u>	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
014	N	Y	Error code 8003 ₁₆ displayed?
015		<u>1</u>	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
016	N	Y	Error code 8004 ₁₆ displayed?
017		<u>1</u>	Replace PC boards in the following order: Chassis locations A01, A02, A03, A04, A05, and A06 (19404-1/2/10/11) or A15, A16, A17, A18, A19, and A20 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) may require tuning; refer to section 3.)
018	N	Y	Error code 8005 ₁₆ displayed?
	C	D	

C	D	
019	1	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
020	2	Replace each of the remaining PC boards one at a time.
021	N Y	Error code 8006 ₁₆ displayed?
022	1	Replace PC board at chassis location A02 (19404-1/2/10/11) or A16 (19404-3/12).
023	2	Replace each of the remaining PC boards one at a time.
024	N Y	Error code 8007 ₁₆ displayed?
025	1	Replace PC boards in the following order: Chassis locations A02, A03, and A07 (19404-1/2/10/11) or A16, A17, and A21 (19404-3/12).
026	N Y	Error code 8040 ₁₆ /100 ₈ displayed? (General status 5100 ₈ .)
027	1	Set equipment type in switches SW1-2, SW1-3, and SW1-4 on PC board at chassis location A04 (19404-1/2/10/11) or A18 (19404-3/12). (These switches specify equipment type connected to coupler.)
028	N Y	Error code 8051 ₁₆ /121 ₈ displayed? (General status 5121 ₈ .)
029	1	Replace PC boards at chassis locations A11 and A13 (19404-1/2/10/11) or A25 and A27 (19404-3/12).
030	N Y	Error code 8052 ₁₆ /122 ₈ displayed? (General status 5122 ₈ .)
031	1	Replace PC boards at chassis locations A12 and A13 (19404-1/2/10/11) or A26 and A27 (19404-3/12).
032	N Y	Error code 8053 ₁₆ /123 ₈ displayed? (General status 5123 ₈ .)
033	1	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
034	N Y	Error code 8054 ₁₆ /124 ₈ displayed? (General status 5124 ₈ .)
035	1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
036	N Y	Error code 8055 ₁₆ /125 ₈ displayed? (General status 5125 ₈ .)
037	1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
038	N Y	Error code 8056 ₁₆ /126 ₈ displayed? (General status 5126 ₈ .)
E	F	

	E	F	
039		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
040	N	Y	Error code 8057 ₁₆ /127 ₈ displayed? (General status 5127 ₈ .)
041		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
042	N	Y	Error code 8058 ₁₆ /130 ₈ displayed? (General status 5130 ₈ .)
043		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
044	N	Y	Error code 8059 ₁₆ /131 ₈ displayed? (General status 5131 ₈ .)
045		1	Check seating/condition of Bus Out and Tag Out cables.
046	N	Y	Error code 805A ₁₆ /132 ₈ displayed? (General status 5132 ₈ .)
047		1	Replace PC boards at chassis locations A08, A13, and A10 (19404-1/2/10/11) or A22, A27, and A24 (19404-3/12).
048	N	Y	Error code 805B ₁₆ /133 ₈ displayed? (General status 5133 ₈ .)
049		1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
050	N	Y	Error code 805C ₁₆ /134 ₈ displayed? (General status 5134 ₈ .)
051		1	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
052	N	Y	Error code 805D ₁₆ /135 ₈ displayed? (General status 5135 ₈ .)
053		1	Replace PC board at chassis location A02 (19404-1/2/10/11) or A16 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
054	N	Y	Error code 805E ₁₆ /136 ₈ displayed? (General status 5136 ₈ .)
055		1	Replace PC boards at chassis locations A12, A10, and A11 (FV205) or A26, A24, or A25 (19404-3/12); check Bus Out/Tag Out cables; and check external device.
056	N	Y	Error code 805F ₁₆ /137 ₈ displayed? (General status 5137 ₈ .)
057		1	This error code is not used.
058	N	Y	Error code 8061 ₁₆ /141 ₈ displayed? (General status 5141 ₈ .)
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059		<u>1</u>	Replace PC boards at chassis locations A11 and A13 (19404-1/2/10/11) or A25 and A27 (19404-3/12).
060	N	Y	Error code 8062 ₁₆ /142 ₈ displayed? (General status 5142 ₈ .)
061		<u>1</u>	Replace PC boards at chassis locations A12 and A13 (19404-1/2/10/11) or A26 and A27 (19404-3/12).
062	N	Y	Error code 8063 ₁₆ /143 ₈ displayed? (General status 5143 ₈ .)
063		<u>1</u>	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
064	N	Y	Error code 8064 ₁₆ /144 ₈ displayed? (General status 5144 ₈ .)
065		<u>1</u>	Replace PC board at chassis locations A13 (19404-1/2/10/11) or A27 (19404-3/12).
066	N	Y	Error code 8065 ₁₆ /145 ₈ displayed? (General status 5145 ₈ .)
067		<u>1</u>	Replace PC board at chassis locations A13 (19404-1/2/10/11) or A27 (19404-3/12).
068	N	Y	Error code 8066 ₁₆ /146 ₈ displayed? (General status 5146 ₈ .)
069		<u>1</u>	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
070	N	Y	Error code 8067 ₁₆ /147 ₈ displayed? (General status 5147 ₈ .)
071		<u>1</u>	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
072	N	Y	Error code 8068 ₁₆ /150 ₈ displayed? (General status 5150 ₈ .)
073		<u>1</u>	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
074	N	Y	Error code 8069 ₁₆ /151 ₈ displayed? (General status 5151 ₈ .)
075		<u>1</u>	Check seating/condition of Bus Out and Tag Out cables.
076	N	Y	Error code 806A ₁₆ /152 ₈ displayed? (General status 5152 ₈ .)
077		<u>1</u>	Replace PC boards at chassis locations A08, A13, and A10 (19404-1/2/10/11) or A22, A27, and A24 (19404-3/12).
078	N	Y	Error code 806B ₁₆ /153 ₈ displayed? (General status 5153 ₈ .)
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079		<u>1</u>	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
080	N	Y	Error code 806C ₁₆ /154 ₈ displayed? (General status 5154 ₈ .)
081		<u>1</u>	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
082	N	Y	Error code 806D ₁₆ /155 ₈ displayed? (General status 5155 ₈ .)
083		<u>1</u>	Replace PC board at chassis location A02 (19404-1/2/10/11) or A16 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
084	N	Y	Error code 806E ₁₆ /156 ₈ displayed? (General status 5156 ₈ .)
085		<u>1</u>	Replace PC boards at chassis locations A12, A10, and A11 (19404-1/2/10/11) or A26, A24, and A25 (19404-3/12); check Bus Out/Tag Out cables; and check external device.
086	N	Y	Error code 806F ₁₆ /157 ₈ displayed? (General status 5157 ₈ .)
087		<u>1</u>	This error code is not used.
088	N	Y	Error code 8070 ₁₆ displayed? (General status 5160 ₈ .)
089		<u>1</u>	Replace PC board at chassis locations A08 and A09 (19404-1/2/10/11) or A22 and A23 (19404-3/12).
090	N	Y	Error code 8071 ₁₆ /161 ₈ displayed? (General status 5161 ₈ .)
091		<u>1</u>	Replace PC boards at chassis locations A11 and A13 (19404-1/2/10/11) or A25 and A27 (19404-3/12).
092	N	Y	Error code 8072 ₁₆ /162 ₈ displayed? (General status 5162 ₈ .)
093		<u>1</u>	Replace PC boards at chassis locations A12 and A13 (19404-1/2/10/11) or A26 and A27 (19404-3/12).
094	N	Y	Error code 8073 ₁₆ /163 ₈ displayed? (General status 5163 ₈ .)
095		<u>1</u>	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
096	N	Y	Error code 8074 ₁₆ /164 ₈ displayed? (General status 5164 ₈ .)
097		<u>1</u>	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
098	N	Y	Error code 8075 ₁₆ /165 ₈ displayed? (General status 5165 ₈ .)
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099		1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
100	N	Y	Error code 8076 ₁₆ /166 ₈ displayed? (General status 5166 ₈ .)
101		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
102	N	Y	Error code 8077 ₁₆ /167 ₈ displayed? (General status 5167 ₈ .)
103		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
104	N	Y	Error code 8078 ₁₆ /170 ₈ displayed? (General status 5170 ₈ .)
105		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
106	N	Y	Error code 8079 ₁₆ /171 ₈ displayed? (General status 5171 ₈ .)
107		1	Check seating/condition of Bus Out and Tag Out cables.
108	N	Y	Error code 807A ₁₆ /172 ₈ displayed? (General status 5172 ₈ .)
109		1	Replace PC boards at chassis locations A08, A13, and A10 (19404-1/2/10/11) or A22, A27, and A24 (19404-3/12).
110	N	Y	Error code 807B ₁₆ /173 ₈ displayed? (General status 5173 ₈ .)
111		1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
112	N	Y	Error code 807C ₁₆ /174 ₈ displayed? (General status 5174 ₈ .)
113		1	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
114	N	Y	Error code 807D ₁₆ /175 ₈ displayed? (General status 5175 ₈ .)
115		1	Replace PC board at chassis location A02 (19404-1/2/10/11) or A16 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
116	N	Y	Error code 807E ₁₆ /176 ₈ displayed? (General status 5176 ₈ .)
117		1	Replace PC boards at chassis locations A12, A10, and A11 (19404-1/2/10/11) or A26, A24, or A25 (19404-3/12); check Bus Out/Tag Out cables; and check external device.
118	N	Y	Error code 807F ₁₆ /177 ₈ displayed? (General status 5177 ₈ .)
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119		<u>1</u>	This error code is not used.
120	N	Y	Error code 8080 ₁₆ /200 ₈ displayed? (General status 5200 ₈ .)
121		<u>1</u>	Replace PC boards at chassis locations A08, A10, and A11 (19404-1/2/10/11) or A22, A24, and A25 (19404-3/12).
122	N	Y	Error code 8081 ₁₆ /201 ₈ displayed? (General status 5201 ₈ .)
123		<u>1</u>	Replace PC boards at chassis locations A11 and A13 (19404-1/2/10/11) or A25 and A27 (19404-3/12).
124	N	Y	Error code 8082 ₁₆ /202 ₈ displayed? (General status 5202 ₈ .)
125		<u>1</u>	Replace PC boards at chassis locations A12 and A13 (19404-1/2/10/11) or A26 and A27 (19404-3/12).
126	N	Y	Error code 8083 ₁₆ /203 ₈ displayed? (General status 5203 ₈ .)
127		<u>1</u>	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
128	N	Y	Error code 8084 ₁₆ /204 ₈ displayed? (General status 5204 ₈ .)
129		<u>1</u>	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
130	N	Y	Error code 8085 ₁₆ /205 ₈ displayed? (General status 5205 ₈ .)
131		<u>1</u>	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
132	N	Y	Error code 8086 ₁₆ /206 ₈ displayed? (General status 5206 ₈ .)
133		<u>1</u>	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
134	N	Y	Error code 8087 ₁₆ /207 ₈ displayed? (General status 5207 ₈ .)
135		<u>1</u>	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
136	N	Y	Error code 8088 ₁₆ /210 ₈ displayed? (General status 5210 ₈ .)
137		<u>1</u>	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
138	N	Y	Error code 8089 ₁₆ /211 ₈ displayed? (General status 5211 ₈ .)
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139		1	Check seating/condition of Bus Out and Tag Out cables.
140	N	Y	Error code 808A ₁₆ /212 ₈ displayed? (General status 5212 ₈ .)
141		1	Replace PC boards at chassis locations A08, A13, and A10 (19404-1/2/10/11) or A22, A27, and A24 (19404-3/12).
142	N	Y	Error code 808B ₁₆ /213 ₈ displayed? (General status 5213 ₈ .)
143		1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
144	N	Y	Error code 808C ₁₆ /214 ₈ displayed? (General status 5214 ₈ .)
145		1	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
146	N	Y	Error code 808D ₁₆ /215 ₈ displayed? (General status 5215 ₈ .)
147		1	Replace PC board at chassis location A02 (19404-1/2/10/11) or A16 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
148	N	Y	Error code 808E ₁₆ /216 ₈ displayed? (General status 5216 ₈ .)
149		1	Replace PC boards at chassis locations A12, A10, and A11 (19404-1/2/10/11) or A26, A24, and A25 (19404-3/12); check Bus Out/Tag Out cables; and check external device.
150	N	Y	Error code 808F ₁₆ /217 ₈ displayed? (General status 5217 ₈ .)
151		1	This error code is not used.
152	N	Y	Error code 8090 ₁₆ /220 ₈ displayed? (General status 5220 ₈ .)
153		1	Replace PC boards at chassis locations A13, A11, and A10 (19404-1/2/10/11) or A27, A25, and A24 (19404-3/12).
154	N	Y	Error code 8091 ₁₆ /221 ₈ displayed? (General status 5221 ₈ .)
155		1	Replace PC boards at chassis locations A07, A11, and A13 (19404-1/2/10/11) or A21, A25, and A27 (19404-3/12).
156	N	Y	Error code 8092 ₁₆ /222 ₈ displayed? (General status 5222 ₈ .)
157		1	Replace PC boards at chassis locations A12 and A13 (19404-1/2/10/11) or A26 and A27 (19404-3/12).
158	N	Y	Error code 8093 ₁₆ /223 ₈ displayed? (General status 5223 ₈ .)
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159	1	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
160	N Y	Error code 8094 ₁₆ /224 ₈ displayed? (General status 5224 ₈ .)
161	1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
162	N Y	Error code 8095 ₁₆ /225 ₈ displayed? (General status 5225 ₈ .)
163	1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
164	N Y	Error code 8096 ₁₆ /226 ₈ displayed? (General status 5226 ₈ .)
165	1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
166	N Y	Error code 8097 ₁₆ /227 ₈ displayed? (General status 5227 ₈ .)
167	1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
168	N Y	Error code 8098 ₁₆ /230 ₈ displayed? (General status 5230 ₈ .)
169	1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
170	N Y	Error code 8099 ₁₆ /231 ₈ displayed? (General status 5231 ₈ .)
171	1	Check seating/condition of Bus Out and Tag Out cables.
172	N Y	Error code 809A ₁₆ /232 ₈ displayed? (General status 5232 ₈ .)
173	1	Replace PC boards at chassis locations A08, A13, and A10 (19404-1/2/10/11) or A22, A27, and A24 (19404-3/12).
174	N Y	Error code 809B ₁₆ /233 ₈ displayed? (General status 5233 ₈ .)
175	1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
176	N Y	Error code 809C ₁₆ /234 ₈ displayed? (General status 5234 ₈ .)
177	1	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
178	N Y	Error code 809D ₁₆ /235 ₈ displayed? (General status 5235 ₈ .)
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179		1	Replace PC board at chassis location A02 (19404-1/2/10/11) or A16 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
180	N	Y	Error code 809E ₁₆ /236 ₈ displayed? (General status 5236 ₈ .)
181		1	Replace PC boards at chassis locations A12, A10, and A11 (19404-1/2/10/11) or A26, A24, and A25 (19404-3/12); check Bus Out/Tag Out cables; and check external device.
182	N	Y	Error code 809F ₁₆ /237 ₈ displayed? (General status 5237 ₈ .)
183		1	This error code is not used.
184	N	Y	Error code 80A0 ₁₆ /240 ₈ displayed? (General status 5240 ₈ .)
185		1	Replace PC boards at chassis locations A08 and A11 (19404-1/2/10/11) or A22 and A25 (19404-3/12).
186	N	Y	Error code 80A8 ₁₆ /250 ₈ displayed? (General status 5250 ₈ .)
187		1	Replace PC boards at chassis locations A08 and A11 (19404-1/2/10/11) or A22 and A25 (19404-3/12).
188	N	Y	Error code 80A9 ₁₆ /251 ₈ displayed? (General status 5251 ₈ .)
189		1	Replace PC board at chassis location A08 (19404-1/2/10/11) or A22 (19404-3/12).
190	N	Y	Error code 80AA ₁₆ /252 ₈ displayed? (General status 5252 ₈ .)
191		1	Replace PC boards at chassis locations A13 and A11 (19404-1/2/10/11) or A27 and A25 (19404-3/12).
192	N	Y	Error code 80AB ₁₆ /253 ₈ displayed? (General status 5253 ₈ .)
193		1	Replace PC boards at chassis locations A08, A11, A12, and A09 (19404-1/2/10/11) or A22, A25, A26, and A23 (19404-3/12).
194	N	Y	Error code 80AC ₁₆ /254 ₈ displayed? (General status 5254 ₈ .)
195		1	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12).
196	N	Y	Error code 80AD ₁₆ /255 ₈ displayed? (General status 5255 ₈ .)
197		1	Replace PC boards at chassis locations A13 and A10 (19404-1/2/10/11) or A27 and A24 (19404-3/12).
198	N	Y	Error code 80B1 ₁₆ /261 ₈ displayed? (General status 5261 ₈ .)
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199		1	Replace PC boards at chassis locations A11 and A13 (19404-1/2/10/11) or A25 and A27 (19404-3/12).
200	N	Y	Error code 80B2 ₁₆ /262 ₈ displayed? (General status 5262 ₈ .)
201		1	Replace PC boards at chassis locations A12 and A13 (19404-1/2/10/11) or A26 and A27 (19404-3/12).
202	N	Y	Error code 80B3 ₁₆ /263 ₈ displayed? (General status 5263 ₈ .)
203		1	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
204	N	Y	Error code 80B4 ₁₆ /264 ₈ displayed? (General status 5264 ₈ .)
205		1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
206	N	Y	Error code 80B5 ₁₆ /265 ₈ displayed? (General status 5265 ₈ .)
207		1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
208	N	Y	Error code 80B6 ₁₆ /266 ₈ displayed? (General status 5266 ₈ .)
209		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
210	N	Y	Error code 80B7 ₁₆ /267 ₈ displayed? (General status 5267 ₈ .)
211		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
212	N	Y	Error code 80B8 ₁₆ /270 ₈ displayed? (General status 5270 ₈ .)
213		1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
214	N	Y	Error code 80B9 ₁₆ /271 ₈ displayed? (General status 5271 ₈ .)
215		1	Check seating/condition of Bus Out and Tag Out cables.
216	N	Y	Error code 80BA ₁₆ /272 ₈ displayed? (General status 5272 ₈ .)
217		1	Replace PC boards at chassis locations A08, A13, and A10 (19404-1/2/10/11) or A22, A27, and A24 (19404-3/12).
218	N	Y	Error code 80BB ₁₆ /273 ₈ displayed? (General status 5273 ₈ .)
	X	Z	

	X	Z	
219		1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
220	N	Y	Error code 80BC ₁₆ /274 ₈ displayed? (General status 5274 ₈ .)
221		1	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
222	N	Y	Error code 80BD ₁₆ /275 ₈ displayed? (General status 5275 ₈ .)
223		1	Replace PC board at chassis location A02 (19404-1/2/10/11) or A16 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
224	N	Y	Error code 80BE ₁₆ /276 ₈ displayed? (General status 5276 ₈ .)
225		1	Replace PC boards at chassis locations A12, A10, and A11 (19404-1/2/10/11) or A27, A24, and A25 (19404-3/12); check Bus Out/Tag Out cables; and check external device.
226	N	Y	Error code 80BF ₁₆ /277 ₈ displayed? (General status 5277 ₈ .)
227		1	This error code is not used.
228	N	Y	Error code 80C0 ₁₆ /300 ₈ displayed? (General status 5300 ₈ .)
229		1	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12).
230	N	Y	Error code 80C1 ₁₆ /301 ₈ displayed? (General status 5301 ₈ .)
231		1	Replace PC boards at chassis locations A11 and A13 (19404-1/2/10/11) or A25 and A27 (19404-3/12).
232	N	Y	Error code 80C2 ₁₆ /302 ₈ displayed? (General status 5302 ₈ .)
233		1	Replace PC boards at chassis locations A12 and A13 (19404-1/2/10/11) or A26 and A27 (19404-3/12).
234	N	Y	Error code 80C3 ₁₆ /303 ₈ displayed? (General status 5303 ₈ .)
235		1	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
236	N	Y	Error code 80C4 ₁₆ /304 ₈ displayed? (General status 5304 ₈ .)
237		1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
238	N	Y	Error code 80C5 ₁₆ /305 ₈ displayed? (General status 5305 ₈ .)
	a	b	

a	b	
239	1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12).
240	N Y	Error code 80C6 ₁₆ /306 ₈ displayed? (General status 5306 ₈ .)
241	1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
242	N Y	Error code 80C7 ₁₆ /307 ₈ displayed? (General status 5307 ₈ .)
243	1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
244	N Y	Error code 80C8 ₁₆ /310 ₈ displayed? (General status 5310 ₈ .)
245	1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). (Drivers to external device have a grounded signal.)
246	N Y	Error code 80C9 ₁₆ /311 ₈ displayed? (General status 5311 ₈ .)
247	1	Check seating/condition of Bus Out and Tag Out cables.
248	2	Replace PC boards at chassis locations A12 and A13 (19404-1/2/10/11) or A27 and A27 (19404-3/12).
249	N Y	Error code 80CA ₁₆ /312 ₈ displayed? (General status 5312 ₈ .)
250	1	Replace PC boards at chassis locations A08, A13, and A10 (19404-1/2/10/11) or A22, A27, and A24 (19404-3/12).
251	N Y	Error code 80CB ₁₆ /313 ₈ displayed? (General status 5313 ₈ .)
252	1	Replace PC board at chassis location A13 (19404-1/2/10/11) or A27 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
253	N Y	Error code 80CC ₁₆ /314 ₈ displayed? (General status 5314 ₈ .)
254	1	Replace PC board at chassis location A10 (19404-1/2/10/11) or A24 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
255	N Y	Error code 80CD ₁₆ /315 ₈ displayed? (General status 5315 ₈ .)
256	1	Replace PC board at chassis location A02 (19404-1/2/10/11) or A16 (19404-3/12), check Bus Out/Tag Out cables, and check external device.
257	N Y	Error code 80CE ₁₆ /316 ₈ displayed? (General status 5316 ₈ .)
c	d	

	c	d	
258		1	Replace PC boards at chassis locations A12, A10, and A11 (19404-1/2/10/11) or A26, A24, and A25 (19404-3/12); check Bus Out/Tag Out cables; and check external device.
259	N	Y	Error code 80CF ₁₆ /317 ₈ displayed? (General status 5317 ₈ .)
260		1	This error code is not used.
261	N	Y	Error code 80D8 ₁₆ /330 ₈ displayed? (General status 5330 ₈ .)
262		1	Replace PC boards at chassis locations A13 and A10 (19404-1/2/10/11) or A27 and A24 (19404-3/12).
263	N	Y	Code 8101 ₁₆ /401 ₈ displayed? (General status 5401 ₈ .)
264		1	Retry autoloading. If error persists, try different source data. Replace PC boards at chassis locations A01, A02, and A04 (19404-1/2/10/11) or A15, A16, and A18 (19404-3/12). Check PP I/O channel cables.
265	N	Y	Code 8102 ₁₆ /402 ₈ displayed? (General status 5402 ₈ .)
266		1	Retry autoloading. If error persists, try different source data. Replace PC boards at chassis locations A01, A02, and A04 (19404-1/2/10/11) or A15, A16, and A18 (19404-3/12). Check PP I/O channel cables.
267	N	Y	Code 8103 ₁₆ /403 ₈ displayed? (General status 5403 ₈ .)
268		1	Retry autoloading. If error persists, try different source data. Replace PC boards at chassis locations A01, A02, and A04 (19404-1/2/10/11) or A15, A16, and A18 (19404-3/12). Check PP I/O channel cables.
269	N	Y	Code 8140 ₁₆ /404 ₈ displayed? (General status 5404 ₈ .)
270		1	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
271	N	Y	Code 8141 ₁₆ /501 ₈ displayed? (General status 5501 ₈ .)
272		1	Retry autoloading. If error persists, try different source data and/or load device. Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). Check FIPS I/O device cables. Check external device.
273	N	Y	Code 8142 ₁₆ /502 ₈ displayed? (General status 5502 ₈ .)
274		1	Retry autoloading. If error persists, try different source data and/or load device. Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). Check FIPS I/O device cables. Check external device.
275	N	Y	Code 8143 ₁₆ /503 ₈ displayed? (General status 5503 ₈ .)
	e	f	

e	f	
276	1	Retry autoloading. If error persists, try different source data and/or load device. Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). Check FIPS I/O device cables. Check external device.
277	N Y	Code 8144 ₁₆ /504 ₈ displayed? (General status 5504 ₈ .)
278	1	Retry autoloading. If error persists, try different source data and/or load device. Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). Check FIPS I/O device cables. Check external device.
279	N Y	Code 8145 ₁₆ /505 ₈ displayed? (General status 5505 ₈ .)
280	1	Retry autoloading. If error persists, try different source data and/or load device. Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). Check FIPS I/O device cables. Check external device.
281	N Y	Code 8147 ₁₆ /507 ₈ displayed? (General status 5507 ₈ .)
282	1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). Check FIPS I/O device cables. Check external device.
283	N Y	Code 8148 ₁₆ /510 ₈ displayed? (General status 5510 ₈ .)
284	1	Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). Check FIPS I/O device cables. Check external device.
285	N Y	Code 820X ₁₆ /60X ₈ displayed? (General status 560X ₈ .)
286	1	Retry autoloading. If error persists, try different source data and/or load device. Replace PC boards at chassis locations A11, A12, and A13 (19404-1/2/10/11) or A25, A26, and A27 (19404-3/12). Check FIPS I/O device cables. Check external device.
287	N Y	Code 8800 ₁₆ /000 ₈ displayed? (General status 0000 ₈ .)
g	h	

288	g	h 1	<p>This code indicates normal completion of the internal diagnostics when no LED indicators on the PC boards are lit. Various malfunctions can prevent the display of error codes such that an 8800_{16} may be displayed even though an error exists. Therefore, examine LEDs on PC boards for possible errors and troubleshoot as follows.</p> <p>Board A04 (19404-1/2/10/11) or A18 (19404-3/12)</p> <p>LED 1 (upper) remains lit - Replace board at locations A01 and A04 (19404-1/2/10/11) or A15 and A18 (19404-3/12).</p> <p>LED 2 remains lit - Replace board at locations A02, A03, A05, and A06 (19404-1/2/10/11) or A16, A17, A19, and A20 (19404-3/12).</p> <p>LED 3 remains lit - Replace board at locations A02, A03, and A04 (19404-1/2/10/11) or A16, A17, and A18 (19404-3/12).</p> <p>LED 4 remains lit - Replace board at locations A01 and A04 (19404-1/2/10/11) or A15 and A18 (19404-3/12).</p> <p>LED 5 remains lit - Replace board at locations A05 and A06 (19404-1/2/10/11) or A19 and A20 (19404-3/12).</p> <p>LED 6 remains lit - Replace board at locations A02, A03, and A04 (19404-1/2/10/11) or A16, A17, and A18 (19404-3/12).</p> <p>Board A07 (19404-1/2/10/11) or A21 (19404-3/12)</p> <p>LED remains lit - Replace board at locations A05, A06, and A07 (19404-1/2/10/11) or A19, A20, and A21 (19404-3/12).</p> <p>Board A11 (19404-1/2/10/11) or A12 (19404-1/2/10/11) or A25 (19404-3/12) or A26 (19404-3/12)</p> <p>LED 1 (upper) remains lit - Replace board at locations A08, A09, A10, A11, A12, and A13 (19404-1/2/10/11) or A22, A23, A24, A25, A26, and A27 (19404-3/12).</p> <p>LED 2 (lower) remains lit - Replace board at locations A11 and A12 (19404-1/2/10/11) or A25 and A26 (19404-3/12).</p> <p>Board A14 (FR205 or FV720)</p> <p>LED 1 (upper) remains lit - Replace board at location A14.</p> <p>LED 2 (middle) remains lit - Indicates that the FV720 was the last coupler to write to the maintenance panel.</p> <p>LED 3 (lower) remains lit - Indicates that the FR205 was the last coupler to write to the maintenance panel.</p> <p>Note - If all LEDs are unlit on board A14, replace boards at locations A14, A08, and A09 (19404-1/2/10/11) or A14, A22, and A23 (19404-3/12).</p>
289	N	Y j	<p>Code $8810_{16}/000_8$ displayed? (General status 0000_8.)</p>

	i	j	
290		<u>1</u>	This code indicates that an autoloading from the PP has started.
291	N	Y	Code 8820 ₁₆ /000 ₈ displayed? (General status 0000 ₈ .)
292		<u>1</u>	This code indicates that an autoloading from an attached disk device has started.
293	N	Y	Code 8840 ₁₆ /000 ₈ displayed? (General status 0000.)
294		<u>1</u>	This code indicates that the ROM resident portion of the autoloading routine has successfully completed.
295	N	Y	Code 8888 ₁₆ /000 ₈ displayed? (General status 0000 ₈ .)
296		<u>1</u>	This code indicates that the autoloading routine has successfully completed.
297	<u>1</u>		For any other error code being displayed, examine LEDs on PC board for possible errors. Refer to information following SAM step 288 for LED troubleshooting information. If unable to isolate problem, call Technical Support for assistance.

SAM 4 - CLM Loader/Monitor Errors

This SAM is for isolating errors reported by the CLM loader and monitor program of the PP down-line diagnostics. Refer to section 6 for CLM loader/monitor description and refer to procedure 23 for logic card replacement information.

001	N	Y	Is there a CLM00 - PARAMETER ERROR message?
002		1	Verify parameters entered for test being run.
003	N	Y	Is there a CLM01 - PAUSE IN-LINE FAILED message?
004		1	Replace PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure in section 3 for procedure.)
005	N	Y	Is there a PROCESSOR ERROR ON MASTER CLEAR message? (CE may continue test execution with this error for additional isolation if desired. However, some tests may not execute correctly.)
006		1	Replace RAM PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12) of coupler.
007		2	Execute internal diagnostics per SAM 3 if problem persists.
008	N	Y	Is there a TTTMM STOPPED ON ERROR message? (TTTMM is the name of test/module that stopped.)
009		1	Replace PC boards in the following order: Chassis locations A07, A01, and A04 (19404-1/2/10/11) or A21, A15, and A18 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to section 3 for procedure.)
010	N	Y	Is there an E0002 - CHANNEL PARITY ERROR message?
011		1	Replace PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure in section 3 for procedure.)
012		2	Check CYBER channel I/O cables.
013	N	Y	Is there an E0003 - TEST LOADED INCORRECTLY message?
014		1	Replace PC boards in the following order: Chassis locations A07, A01, A05, and A06 (19404-1/2/10/11) or A21, A01, A19, and A20 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure in section 3 for procedure.)
015	N	Y	Is there an E0004 - TEST NOT IN SYSTEM FILE message?
	A	B	

A	B	
016	<u>1</u>	Attach test to be run by entering K.SCRATCH=XXX. (XXX = CCM, NDM, or NDP.)
017	N Y	Is there a CLEAR RM TO TERMINATE TEST message?
018	<u>1</u>	Indicates that the repeat module switch must be turned off before the test is terminated. If left on, the loader/monitor module keeps repeating.
019	N Y	Is there a CLM01 - CH. ACTIVE AND EMPTY ON INPUT message?
020	<u>1</u>	Replace PC boards at locations A01 and A04 (19404-1/2/10/11) or A15 and A18 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure section 3 for procedure.)
021	N Y	Is there a CLM01 - NO INACTIVE ON EQUIP FUNC message?
022	<u>1</u>	Check CYBER I/O channel assignment being used.
	<u>2</u>	Verify that no indicators remain lit on PC boards at chassis locations A04, A07, and A12 (19404-1/2/10/11) or A18, A21, and A26 (19404-3/12). (A lit indicator indicates that the internal diagnostics have detected an error. Go to SAM 3 to isolate the error.)
	<u>3</u>	Replace PC board at chassis location A01 (19404-1/2/10/11) or A15 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure in section 3 for procedure.)
023	N Y	Is there a CLM02 - HALT - STOPPED ON ERROR message?
024	<u>1</u>	Replace PC board at chassis location A07 (19404-1/2/10/11) or A21 (19404-3/12).
025	<u>1</u>	For any other CLM errors/problems, try running the internal diagnostics per SAM 3 for additional isolation. If problem persists, contact Technical Support for assistance.

SAM 5 - CCM Down-Line Diagnostic Errors

This SAM is for isolating errors detected by the CCM memory test of the PP down-line diagnostics. Refer to section 6 for CCM test description and refer to procedure 23 for logic card replacement information.

001	N	Y	Is there a CCM00 - SUSPECTED PARAMETER ERROR message?
002		1	Verify parameter entry in P1. (P1 must be either 0 or 1 to specify 16K RAM.)
003	N	Y	Is there a CCM01 - CONTROLWARE NOT RUNNING message?
004		1	Replace PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure in section 3 for procedure.)
005	N	Y	Is there a CCM01 - ---- COMPARE ---- message?
006		1	Replace PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure in section 3 for procedure.)
007	N	Y	Is there a CCM0x - ABORTED ON FUNCTION message? (The first function executed is an 0740 that tries to master clear the coupler.)
008		1	Check that CYBER channel I/O cables are present and properly seated.
009		2	Replace PC boards in the following order: Chassis locations A01, A02, A03, and A07 (19404-1/2/10/11) or A15, A16, A17, and A21 (19404-3/12). (PC board at location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure in section 3 for procedure.)
010	N	Y	Is there a CCM01 - ABORTED ON DISCONNECT COMMAND message?
011		1	Replace PC board at location A04 (19404-1/2/10/11) or A18 (19404-3/12).
012	N	Y	Is there a CCM05 - ABORTED ON EMPTY PARITY ERROR message?
013		1	Replace PC board at location A02 (19404-1/2/10/11) or A16 (19404-3/12).
014	N	Y	Is there a CCM0x - ABORTED ON MEM PAR ERROR message?
015		1	Replace PC board at location A07 (19404-1/2/10/11) or A21 (19404-3/12).
016		2	Check for low +5 V.
017	N	Y	Is there a CCM0x - ABORTED ON COMPARE COMMAND message?
	A	B	

	A	B	
018		<u>1</u>	Replace PC boards in the following order: Chassis locations A07 and A01 (19404-1/2/10/11) or and A15 (19404-3/12). (PC board at A21 location A01 (19404-1/2/10/11) or A15 (19404-3/12) might require tuning; refer to Clock Tuning Procedure in section 3 for procedure.)
019	N	Y	Is there a CCM00 - RM SELECTED, PPU STATUS = PAUSE message?
020		<u>1</u>	Change parameter entry to turn off repeat module selection.
021	N	Y	Is there a CCM0x - MODULE WILL NOT RUN WITH AT LESS THAN 10B message?
022		<u>1</u>	Set access level parameter to less than 10 binary.
023	<u>1</u>		For any other CCM test errors/problems, try replacing PC boards at locations A07, A05, and A06 (19404-1/2/10/11) or A21, A19, and A20 (19404-3/12). If problem persists, try to isolate cause by running internal diagnostics per SAM 3, then contact Technical Support for assistance as needed.

SAM 6 - NDM Down-Line Diagnostic Errors

This SAM is for isolating errors detected by the NDM memory test of the PP down-line diagnostics. Refer to section 6 for NDM test description and refer to procedure 23 for logic card replacement information.

001	N	Y	Is there an NDM - PARAMETER ERROR DETECTED message?
002		1	Verify parameter entries and rerun test.
003	1		For any other type of error message reported by NDM, try replacing PC boards at locations A07, A05, and A06 (19404-1/2/10/11) or A21, A19, and A20 (19404-3/12). If problem persists, try to isolate cause by running internal diagnostics per SAM 3, then contact Technical Support for assistance as needed.

SAM 7 - NDP Down-Line Diagnostic Errors

This SAM is for isolating errors detected by the NDP processor test of the PP down-line diagnostics. Refer to section 6 for NDP test description and refer to procedure 23 for logic card replacement information.

001	N	Y	Is there an NDP - PARAMETER ERROR DETECTED message?
002		1	Verify parameter entries and rerun test.
003	1		For any other type of error message reported by NDP, try replacing PC boards at locations A05 and A06 (19404-1/2/10/11) or A19 and A20 (19404-3/12). If problem persists, try to isolate cause by running internal diagnostics per SAM 3, then contact Technical Support for assistance as needed.

Remove/Replace/Adjustment Procedures (19404-1/10)

8

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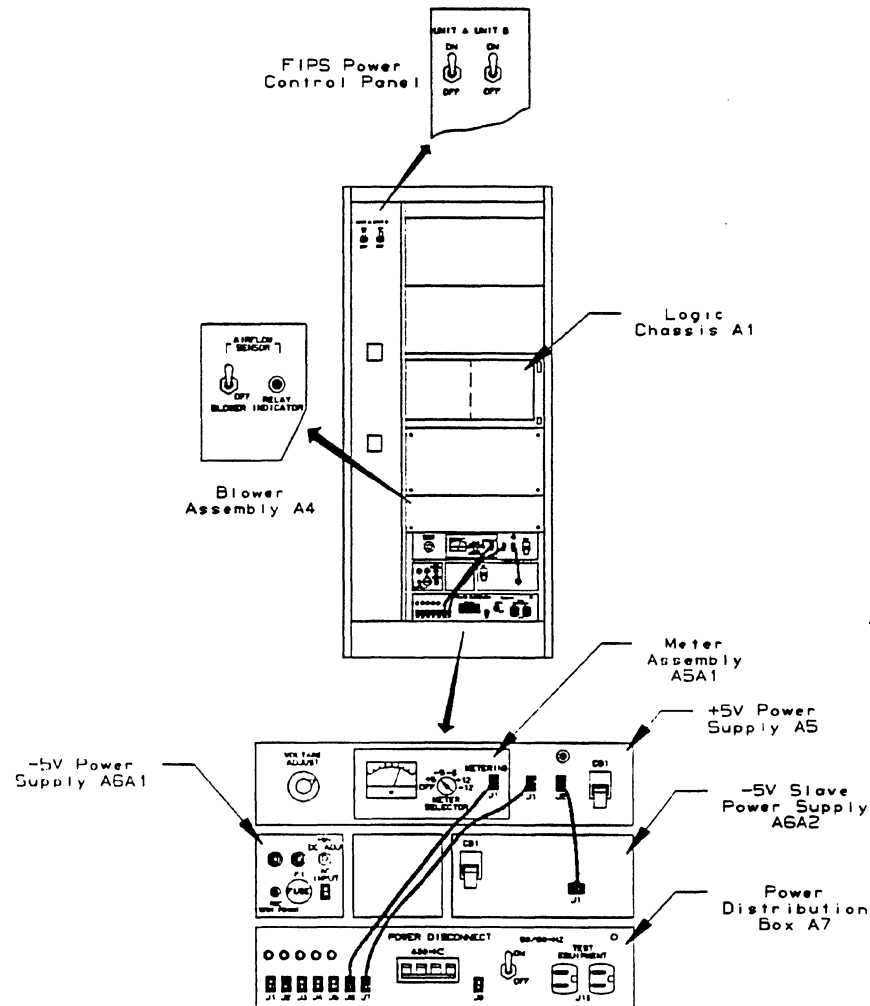
Remove/Replace/Adjustment Procedures (19404-1/10)

8

This section contains remove, replace, and adjustment procedures for 19404-1 and 19404-10 CCCs.

Procedure 1. Power Application/Removal

Refer to figure 8-1 for the location of switches and indicators used in this procedure.



HRM19404-10

Figure 8-1. Location of Input Power Switches

- 8
___ 1. To apply power to the coupler:
 - ___ a. Open front cabinet door and turn 50/60-Hz power disconnect switch ON.
 - ___ b. Turn 400-Hz power disconnect switch/circuit breaker ON; the power on indicator (located on the extreme upper left corner of the cabinet front) will light. If indicator fails to light, verify that site power is available and/or replace lamp (procedure 7).

NOTE

When the 400-Hz power disconnect switch/circuit breaker is left ON while the 50/60-Hz power disconnect switch is OFF, a thermal switch drops 400-Hz input to power supplies after approximately 90 seconds. The airflow sensor relay indicator will light to indicate this condition.

- ___ 2. To remove power from the coupler, turn the 400-Hz power disconnect switch/circuit breaker OFF, then turn the 50/60-Hz power disconnect switch OFF.
- ___ 3. To apply power to the attached subsystem devices, open front cabinet door and turn power on unit A and/or unit B switches ON as applicable.
- ___ 4. To remove power from the attached subsystem devices, turn power on unit A and/or unit B switches OFF as applicable.

Perform the following steps to calibrate the voltage percentage meter of the coupler. Refer to figure 8-2 for location of controls.



- 1. Apply power to coupler (procedure 1).
- 2. Connect digital dc voltmeter between the +5 V bus bar and ground (the +5 V bus bar is located at left side of the cabinet when viewed from the rear). Position the voltmeter so it can be seen from the front of the coupler.
- 3. Turn the +5 V adjust control until the digital voltmeter shows $+5 \pm 0.05$.
- 4. Turn the meter selector switch to the +5 position. If meter shows 0 ± 1 percent, it is calibrated correctly for +5 V.
- 5. Connect digital dc voltmeter between -5 V terminal (E1) at front of -5 V supply and ground.
- 6. Adjust -5 V dc adjust control until digital voltmeter shows -5 ± 0.05 .
- 7. Turn meter selector switch to -5 position. If meter shows 0 ± 1 percent, meter is calibrated correctly for +5 V. If either the +5 V or -5 V calibration is incorrect, go to step 8.
- 8. Refer to figure 8-3 for assembly details and remove four screws mounting meter assembly to +5 V master power supply.

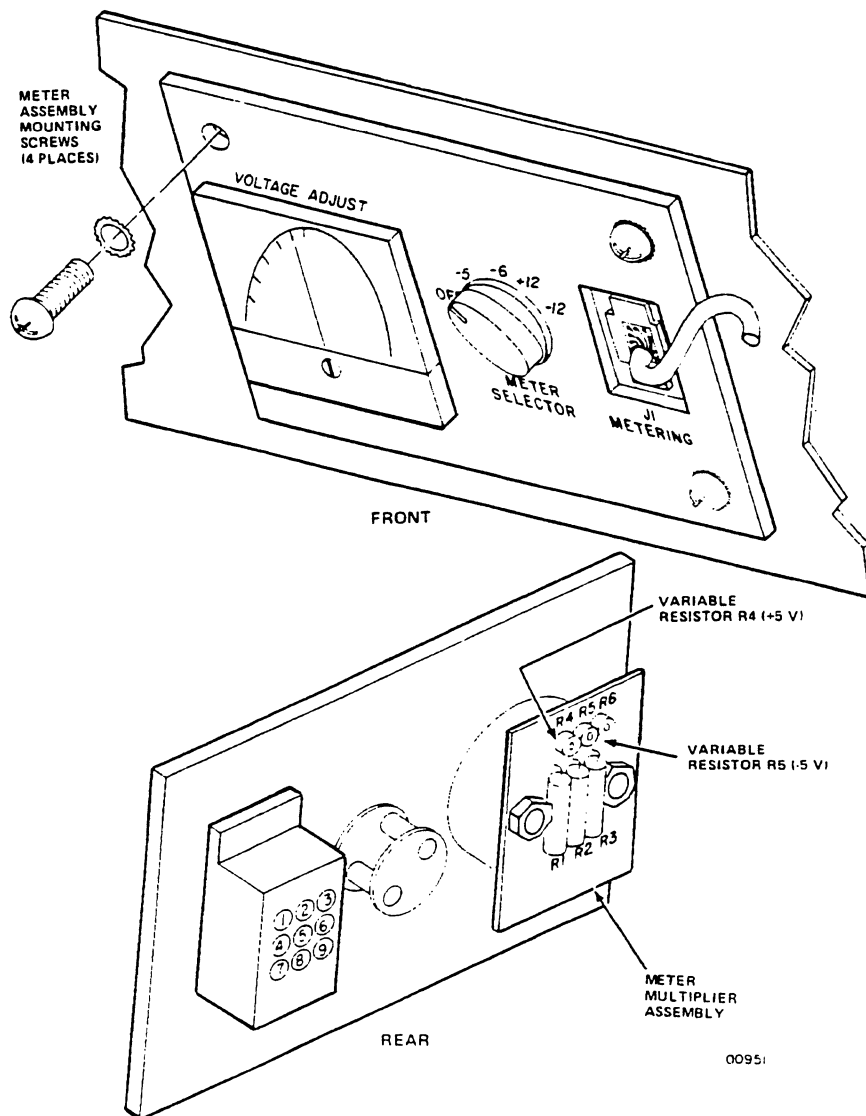


Figure 8-3. Meter Assembly Details

- ___ 9. Turn meter selector switch to the +5 position. Adjust variable resistor R4 until meter shows 0 percent.
- ___ 10. Turn meter selector switch to -5. Adjust variable resistor R4 until meter shows 0 percent.
- ___ 11. If both +5 V and -5 V adjustments produce 0 percent meter readings, reinstall meter assembly in +5 V master power supply. Otherwise, replace meter assembly (procedure 8).

Procedure 3. Airflow Sensor Test

Refer to figure 8-1 for input power control switch and indicator locations and perform the following steps to test the operation of the airflow sensor.

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Turn the 400-Hz power disconnect switch/circuit breaker ON; the power on indicator (located on the extreme upper left corner of the cabinet front) will light.

NOTE

Ensure that the 50/60-Hz power disconnect switch is OFF so that the blower is not running during this test.

- ___ 3. Wait approximately 90 seconds and check for the following.
 - ___ a. If power on indicator goes out and the airflow sensor relay indicator lights, the test is successful. Turn the 400-Hz power disconnect switch/circuit breaker OFF, then turn the 50/60-Hz power disconnect switch ON. Allow time for the unit to cool, then turn the 400-Hz power disconnect switch/circuit breaker ON again.
 - ___ b. If power on indicator goes out, but the airflow sensor relay indicator does not light, replace the airflow sensor relay indicator according to procedure 9.
 - ___ c. If power on indicator does not go out, turn the 400-Hz power disconnect switch/circuit breaker OFF, then replace the airflow sensor according to procedure 10.

Procedure 4. Air Filter Cleaning

To clean the cabinet input air filter, refer to figure 8-4 and perform the following steps.

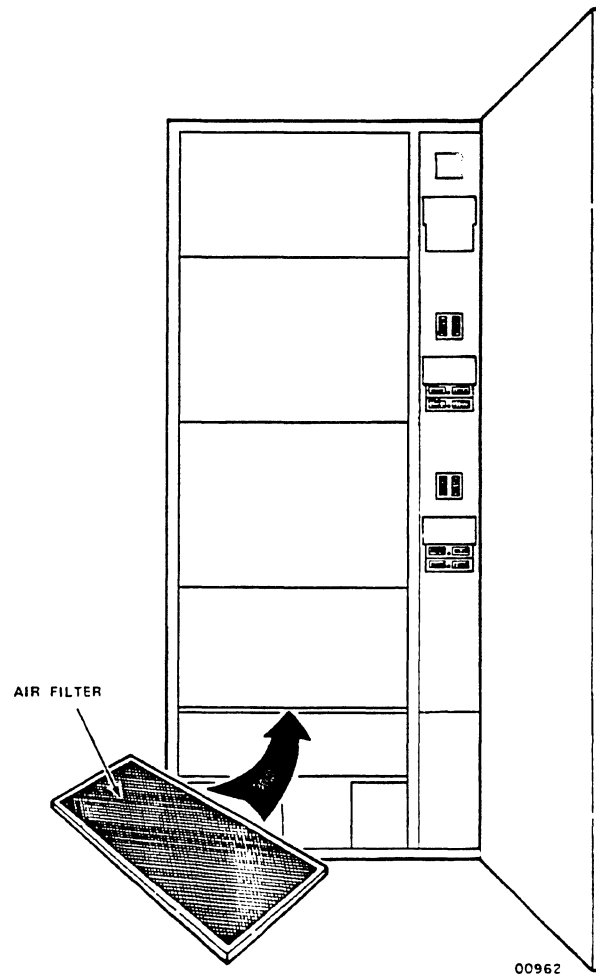


Figure 8-4. Air Filter Location

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Open rear cabinet door and slide air filter out from its position at base of shroud.
- ___ 3. Vacuum filter from the dirty side. If filter still appears dirty after vacuuming, rinse in water, shake to remove excess water, then set aside to dry.
- ___ 4. Insert air filter in cabinet and close rear cabinet door.

Procedure 5. 50/60-Hz Power Fault Isolation

Perform the following steps to isolate 50/60-Hz power faults.

⚠ WARNING

Voltage tests in this procedure involve dangerous voltages. Do not touch exposed voltmeter leads, connector pins, or terminals.

1. Refer to figure 8-5. With coupler power on (procedure 1), carefully attach an ac voltmeter between pins 1 and 2 of connector J9 (located at front of power distribution box) to test for 120 V, then remove power from coupler (procedure 1). If 120 Vac is absent, go to step 3. Otherwise, refer to figure 8-6 and remove the blower assembly front cover.

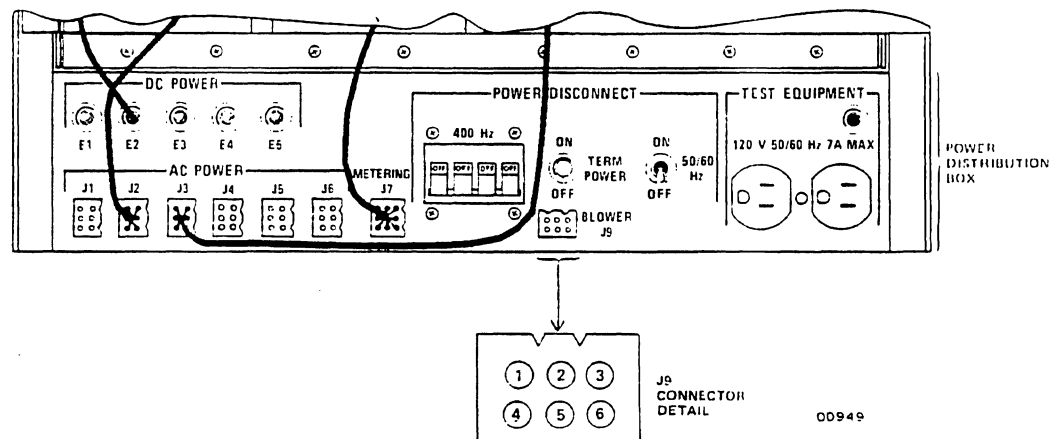


Figure 8-5. Connector J9 Pin Detail

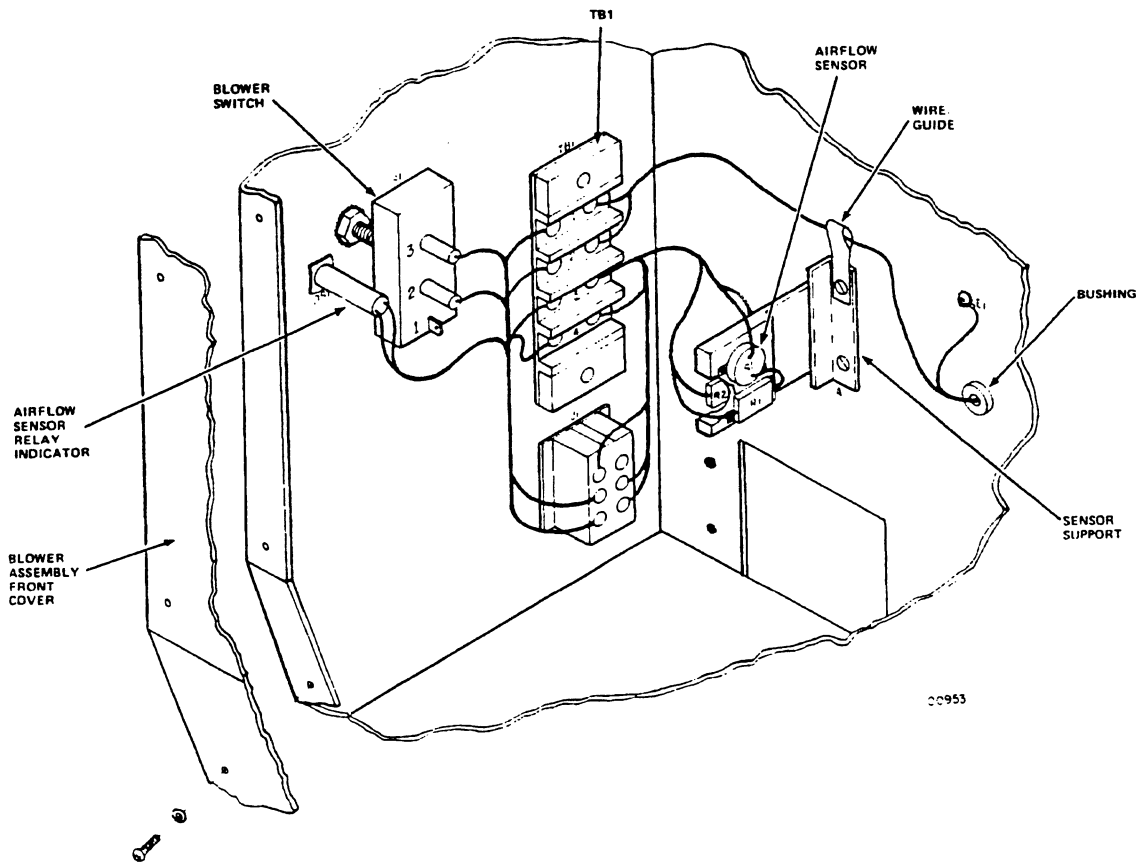


Figure 8-6. Blower Assembly Components

2. Attach an ohmmeter between terminals 2 and 3 of the blower switch (figure 8-6) while the switch is in its rest position to test for continuity. If continuity is present, replace the blower according to procedure 11. Otherwise, replace the blower switch according to procedure 12.

- 3. Refer to figure 8-7 and remove rear power distribution box cover.

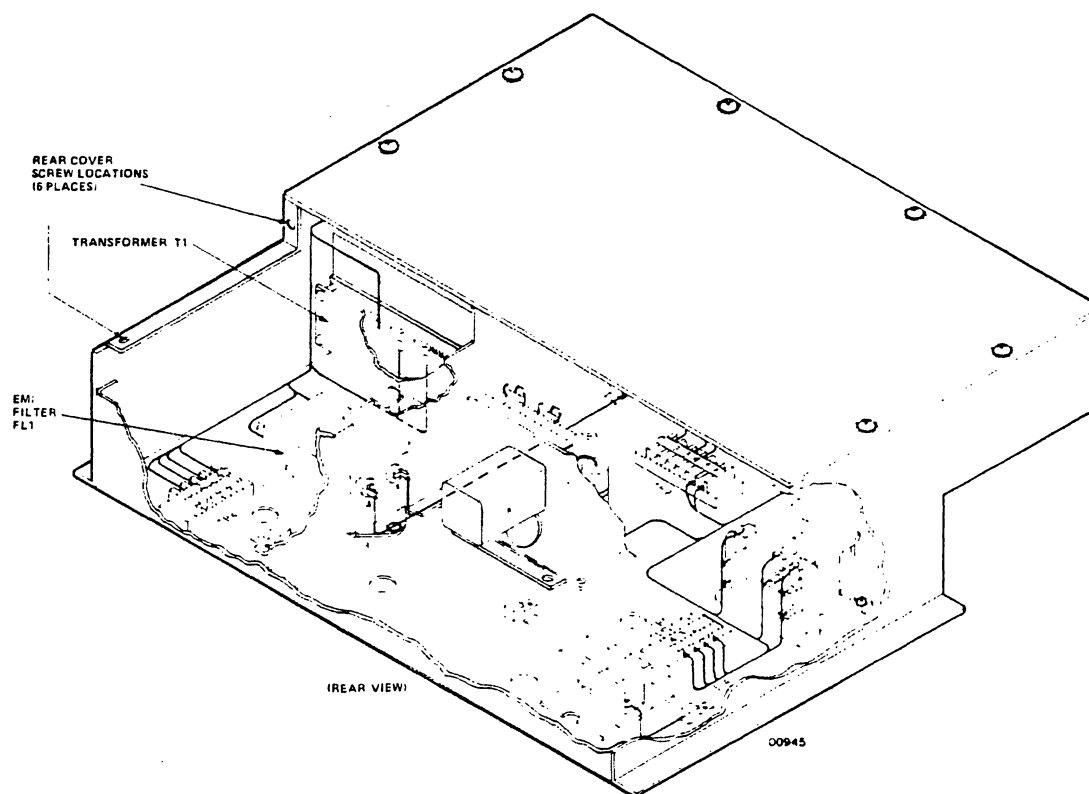


Figure 8-7. Power Distribution Box 50/60-Hz Components

- 4. Turn the 50/60-Hz power disconnect switch ON and attach an ac voltmeter between terminals 1 and 2 of the electromagnetic interference (EMI) filter to test for 120 V. If 120 Vac is present, replace the EMI filter according to procedure 13. If 120 Vac is absent and input power is 60 Hz, replace the 50/60-Hz power disconnect switch according to procedure 14. Otherwise, go to step 5.
- 5. Attach an ac voltmeter between the transformer COM terminal and the appropriate primary (input) transformer lead to test for 220 - 250 Vac. If 220 - 250 Vac is present, replace the transformer according to procedure 15. Otherwise, replace the 50/60-Hz power disconnect switch according to procedure 14.

Procedure 6. 400-Hz Power Fault Isolation

Perform the following steps to isolate 400-Hz power faults.

⚠ WARNING

Voltage tests in this procedure involve dangerous voltages. Do not touch exposed voltmeter leads, connector pins, or terminals.

- ___ 1. Turn coupler power on (procedure 1).
- ___ 2. Refer to figure 8-2 for location of controls and observe percentage meter while turning the meter selector switch from its -5 to +5 position. If the meter pointer remains at left side of percentage scale for both voltages, go to step 5. Otherwise, go to step 3.
- ___ 3. Turn meter selector switch to its -5 position. If it is possible to adjust the -5 V dc adjustment control to make the meter show 0 percent, go to step 4. Otherwise replace the -5 V power supply according to procedure 16.
- ___ 4. Turn the meter selector switch to its +5 position. If it is possible to calibrate the +5 V adjust control to make the meter show 0 percent, go to step 5. Otherwise, replace the +5 V power supply according to procedure 16.
- ___ 5. Refer to figure 8-8 and locate any two unused connectors on the power distribution box numbered between J1 and J6. Attach an ac voltmeter between a single pin of the first and second connector as indicated in the following table to test for 208 Vac.

Phase	First Connector Pin	Second Connector Pin
L1/L2	2	3
L1/L3	2	4
L2/L3	3	4

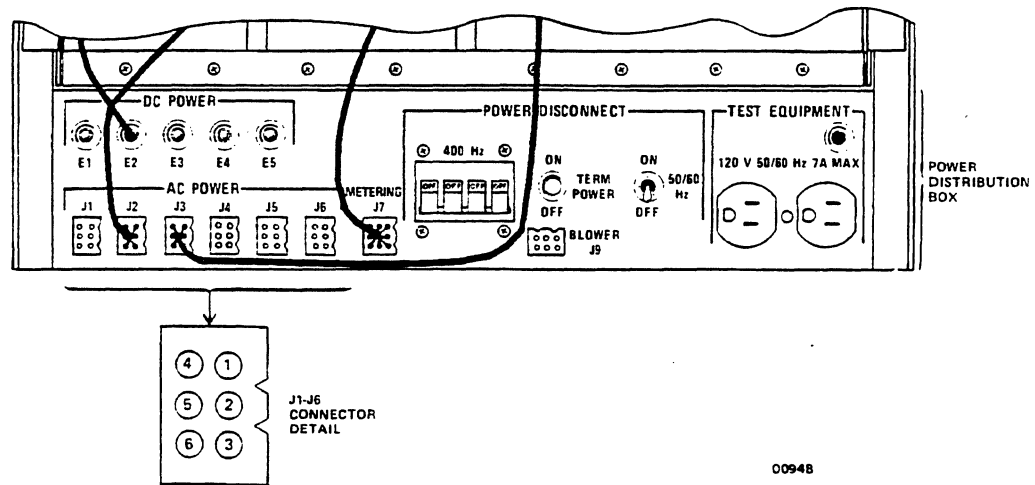


Figure 8-8. Connector Pin Locations

If 208 Vac is present for all phases, request additional help from technical support group to isolate the problem. Otherwise, remove power from coupler (procedure 1), then go to step 6.

— 6. Refer to figure 8-9 and remove rear cover from power distribution box.

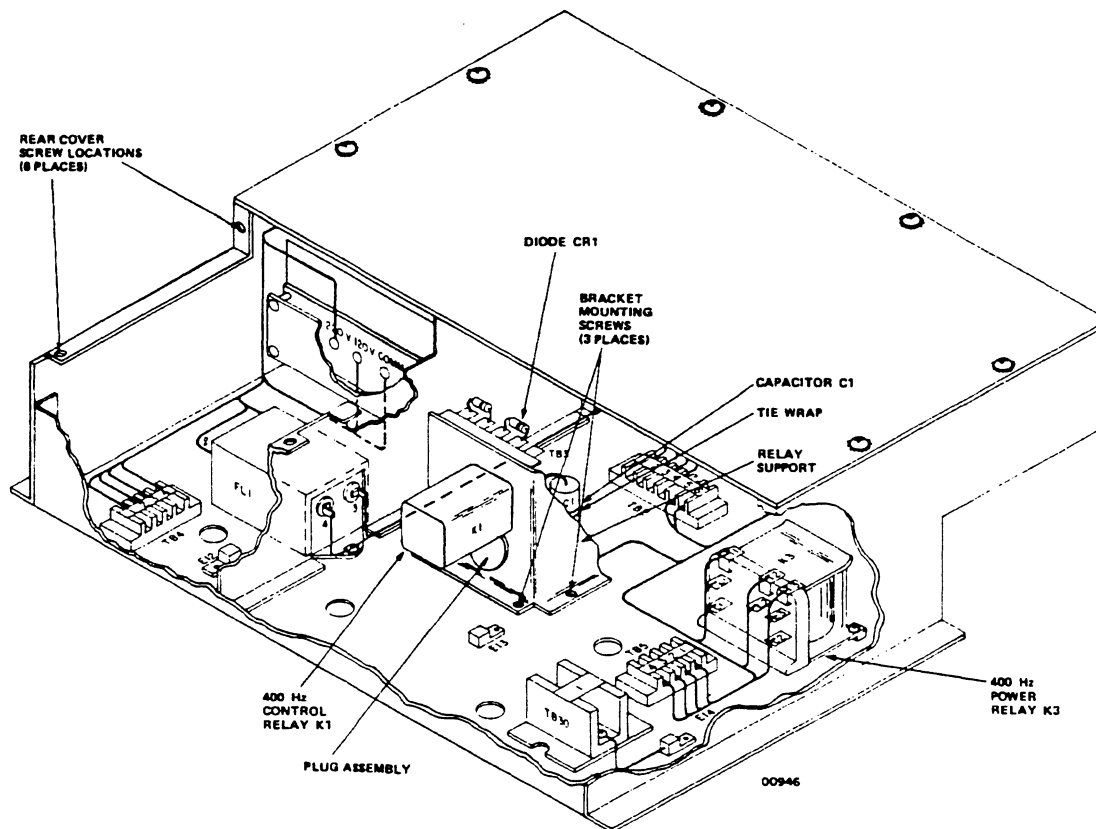


Figure 8-9. Power Distribution Box 400-Hz Components

— 7. Apply power to the coupler (procedure 1). If the test in step 5 indicated that 208 Vac was present for only one or two phases, attach an ac voltmeter between the following terminals of the 400-Hz power relay to test for 208 Vac.

- L1 and L2
- L1 and L3
- L2 and L3

If 208 Vac is present for all phases, replace the 400-Hz power relay according to procedure 17. Otherwise, replace the 400-Hz switch/circuit breaker according to procedure 18.

- 8. Attach an ac voltmeter between terminals C1 and C2 of the 400-Hz power relay to test for 120 Vac. If 120 Vac is present, replace the 400-Hz power relay according to procedure 17. Otherwise, replace the 400-Hz control relay according to procedure 19. If this does not remedy problem, remove power from coupler (procedure 1), re-install the old 400-Hz control relay, then go to step 9.
- 9. Refer to figure 8-6. Remove the blower assembly front cover, then attach an ohmmeter across both terminals of thermal sensor S1 to check for continuity. If open, replace S1 according to procedure 10. If continuity exists, go to step 10.
- 10. Refer to figure 8-9 and remove all screws holding the relay support. Carefully rotate relay support to provide access to diode CR1 and capacitor C1.
- 11. Attach an ohmmeter (placed on low resistance range) across diode CR1 to test resistance. Transpose the ohmmeter leads, then again test resistance across diode. One test should indicate high resistance, while the other test should indicate low resistance. If both tests indicate exclusively high low resistance, replace diode CR1 according to procedure 20. Otherwise, replace capacitor C1 according to procedure 21.

8 Procedure 7. Power On Indicator Lamp Replacement

Refer to figure 8-10 and perform the following steps to replace the power on indicator lamp.

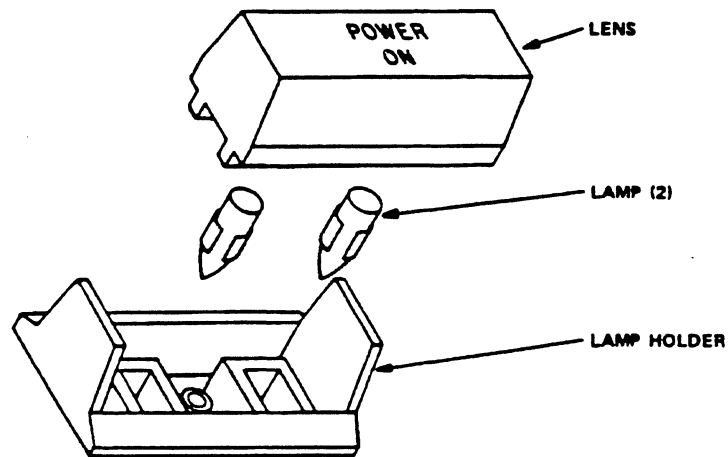


Figure 8-10. POWER ON Indicator Details

- ___ 1. Remove power from coupler (procedure 1).
- ___ 2. Squeeze top and bottom of power on lens and pull to release.
- ___ 3. Remove burned out lamp using long-nose pliers or tweezers.
- ___ 4. Insert the new lamp, then replace the lens.

Procedure 8. Percentage Meter Replacement

Refer to figure 8-11 and perform the following steps to replace the percentage meter assembly.

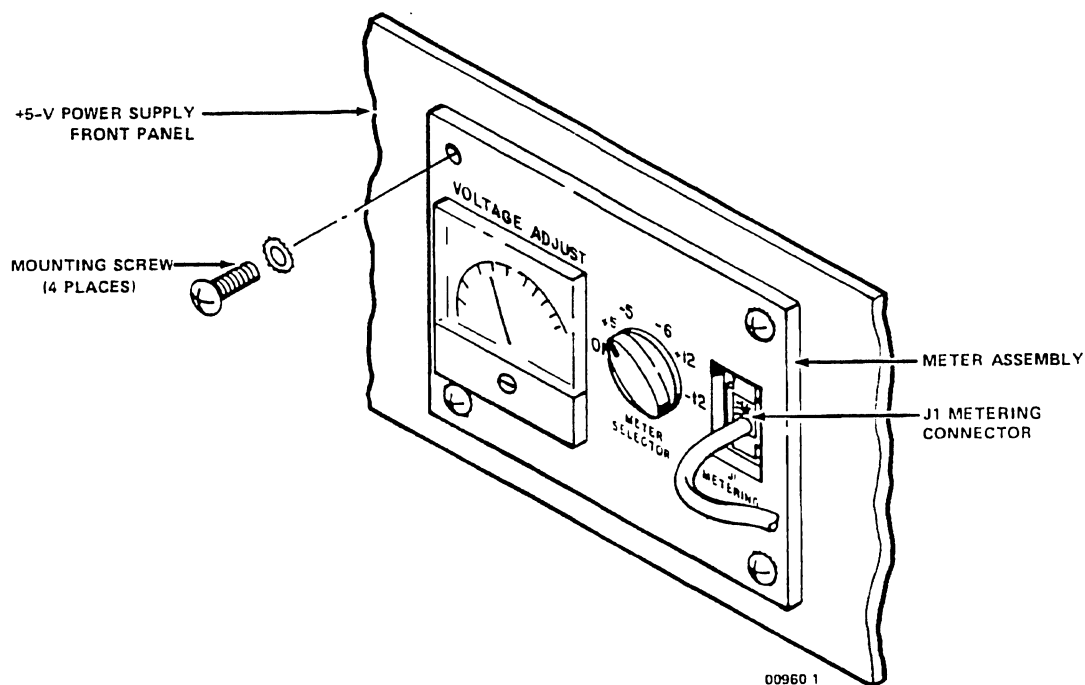


Figure 8-11. Meter Assembly Mounting Details

- ___ 1. Remove power from coupler (procedure 1).
- ___ 2. Disconnect interconnecting cable from the J1 metering connector.
- ___ 3. Remove four screws mounting meter assembly to front panel of +5 V power supply and lift meter assembly free of panel.
- ___ 4. Connect cable removed in step 2 to J1 metering connector of new meter assembly.
- ___ 5. Apply power to coupler (procedure 1).
- ___ 6. Perform meter calibration (procedure 2).
- ___ 7. Mount new meter assembly to front panel of +5 V power supply.

8 Procedure 9. Airflow Sensor Relay Indicator Replacement

Refer to figure 8-12 and perform the following steps to replace the airflow sensor relay indicator.

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Remove front cover from blower assembly (6 screws).
- ___ 3. Disconnect indicator wires from terminals TB1-3 and TB1-4.
- ___ 4. Remove speed nut from sensor indicator, gently force the blower panel away from metal shield, and remove indicator.
- ___ 5. Insert new indicator in blower panel and secure indicator with speed nut.
- ___ 6. Attach spade lugs to indicator wires and connect lugs to terminals TB1-3 and TB1-4.
- ___ 7. Reinstall blower assembly front cover.

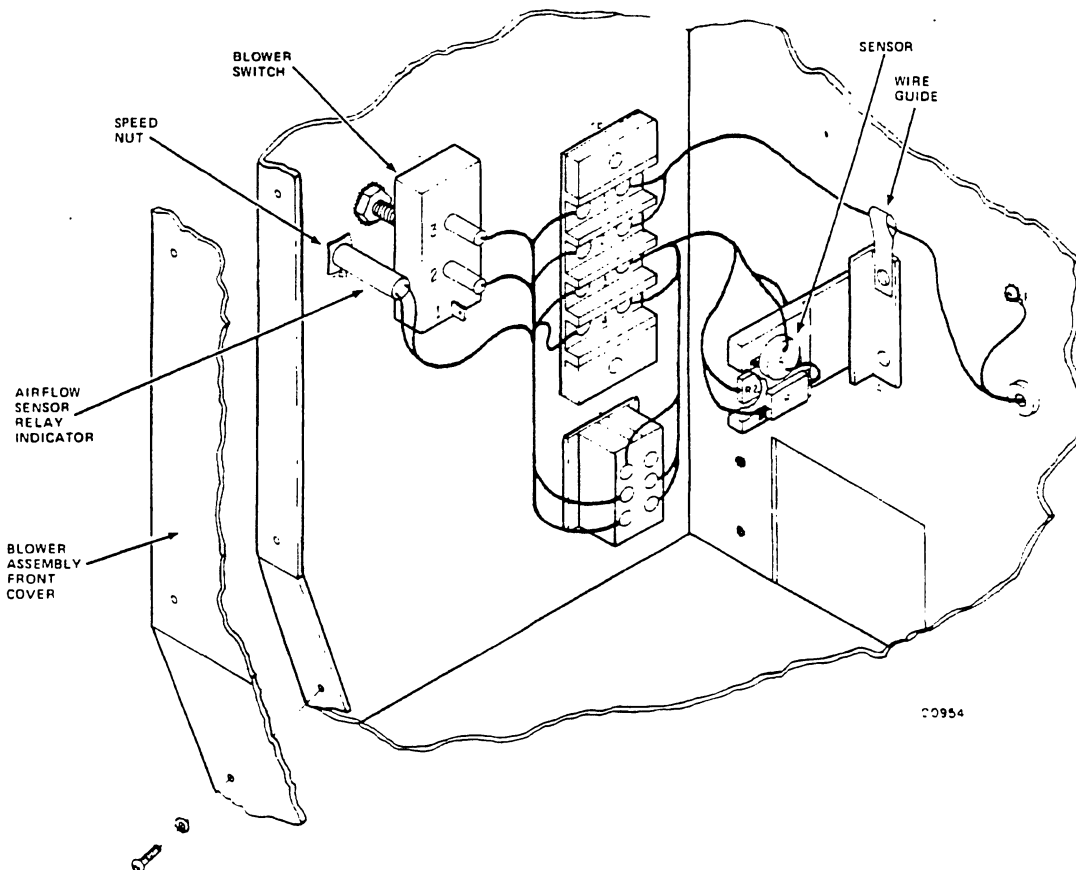


Figure 8-12. Blower Assembly Component Mounting Details

Procedure 10. Airflow Sensor Replacement

Refer to figure 8-12 and perform the following steps to replace the airflow sensor.

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Remove the blower assembly front cover (figure 8-12).
- ___ 3. Tag and unsolder or disconnect four wires from airflow sensor.
- ___ 4. Remove old sensor and install new sensor.
- ___ 5. Solder/connect wires to new sensor according to tags.
- ___ 6. Reinstall blower assembly front cover.

Procedure 11. Blower Assembly Replacement

Perform the following steps to replace the blower assembly.

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Refer to figure 8-12 and remove the blower assembly front cover.
- ___ 3. Disconnect wires from terminals TB1-1, TB1-2, and E1. Remove black wire and white wire from wire guide.
- ___ 4. Refer to figure 8-13 and remove shroud from blower assembly.
- ___ 5. Remove the blower from its mounting panel.
- ___ 6. Pull wires from the new blower through bushing in mounting panel.
- ___ 7. Install new blower on mounting panel with hardware removed in step 4.
- ___ 8. Pass black wire and white wire through wire guide (figure 8-12) and connect blower wires as follows.

Wire	Connection
------	------------

Green	E1
-------	----

White	TB1-1
-------	-------

Black	TB1-2
-------	-------

- ___ 9. Reinstall the blower assembly front cover and shroud (figure 8-13).

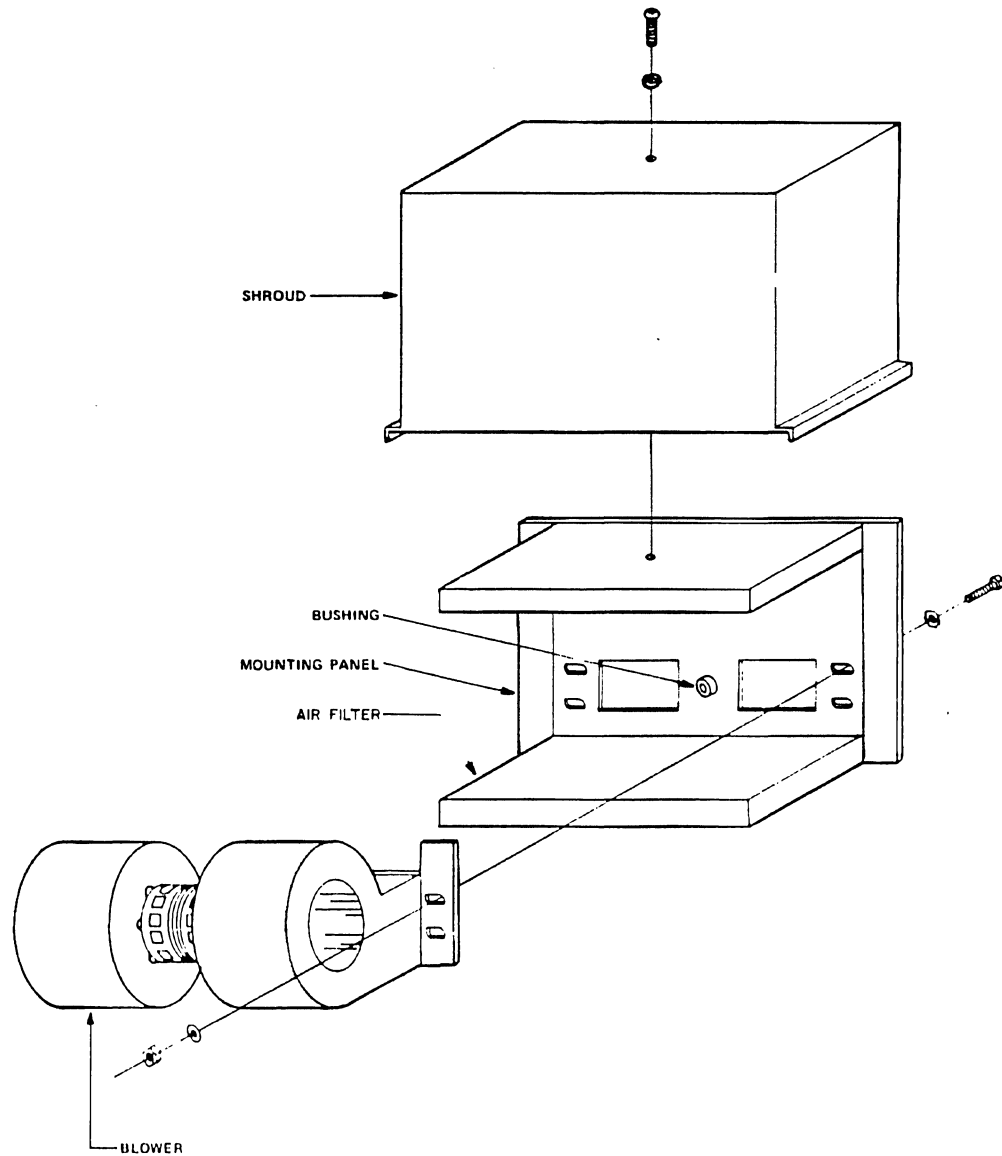


Figure 8-13. Blower, Shroud, and Mounting Panel

Procedure 12. Blower Switch Replacement

To replace the blower switch, refer to figure 8-12 and perform the following steps.

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Remove the blower assembly front cover (figure 8-12).
- ___ 3. Tag and unsolder two wires attached to blower switch.
- ___ 4. Loosen blower switch hex mounting nut from inside of blower panel, remove knurled nut, then remove the blower switch.
- ___ 5. Place new switch in blower panel with flat side of threads facing up. Secure switch with knurled nut, lockwasher, and hex nut.
- ___ 6. Solder wires to new switch according to tags.
- ___ 7. Reinstall blower assembly front cover.

Procedure 13. EMI Filter Replacement

Refer to figure 8-7 and perform the following steps to replace the EMI filter.

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Remove the power distribution box rear cover (figure 8-7).
- ___ 3. Tag and disconnect four wires attached to the EMI filter.
- ___ 4. Remove EMI filter.
- ___ 5. Reverse the first four steps to install a new EMI filter.

Procedure 14. 50/60-Hz Power Disconnect Switch Replacement

Refer to figure 8-14 and perform the following steps to replace the 50/60 HZ Power Disconnect switch.

- 1. Turn coupler power OFF (procedure 1) and turn site wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler OFF. It is suggested that a notice be fastened to these circuit breakers to inform personnel not to turn breakers on.
- 2. Remove plastic baffle and cabinet-mounted power supplies according to procedure 16. Also remove power distribution box front and rear covers (figures 8-14 and 8-9, respectively).

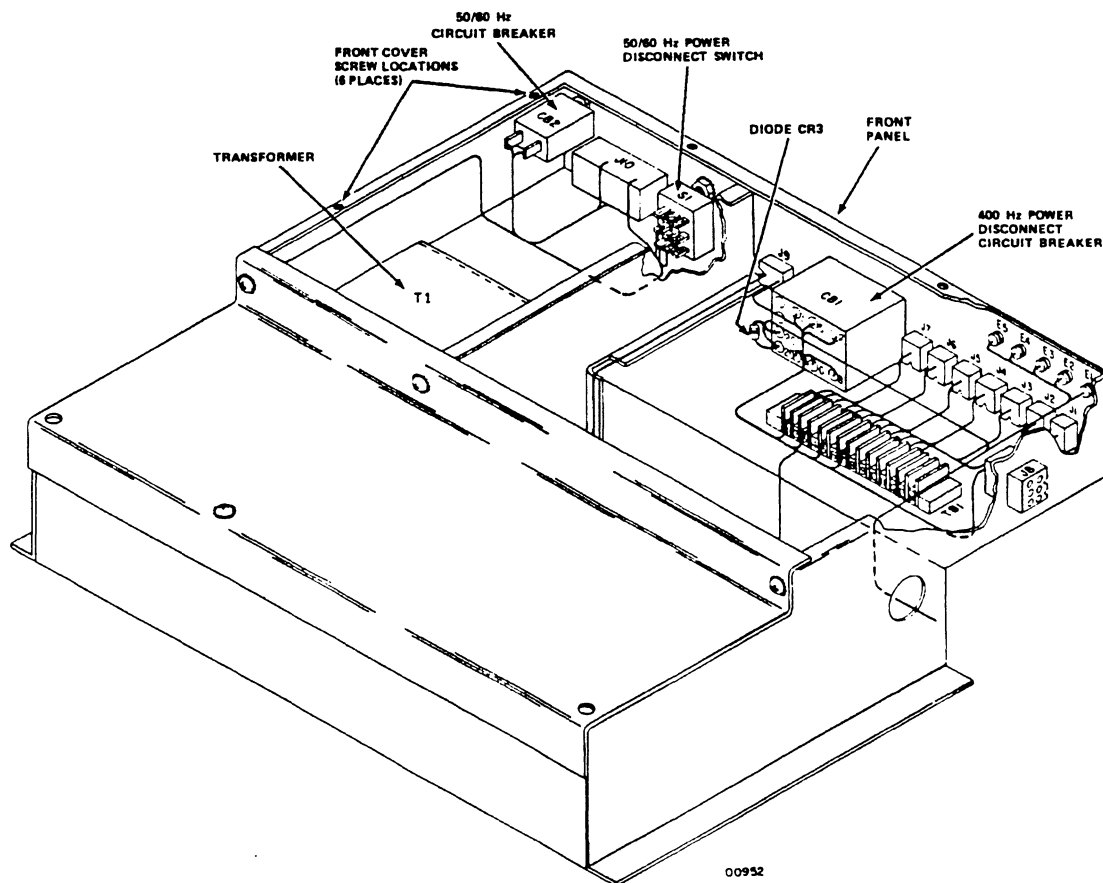


Figure 8-14. Power Distribution Box Front Components

- 3. Tag and disconnect six wires attached to 50/60-Hz power disconnect switch (figure 8-14).
- 4. Note mounting position of the 50/60-Hz power disconnect switch, loosen nut from inside of front panel, remove knurled nut on outside of front panel, then remove the switch.
- 5. Reverse the first four steps to install a new 50/60-Hz power disconnect switch.

Procedure 15. Transformer Replacement

Refer to figure 8-14 and perform the following steps to replace the input ac power transformer.

- ___ 1. Turn coupler power OFF (procedure 1) and turn site wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler OFF. It is suggested that a notice be fastened to these circuit breakers to inform personnel not to turn breakers on.
- ___ 2. Remove cabinet-mounted power supplies (procedure 16).
- ___ 3. Remove plastic baffle and power distribution box front and rear covers (figures 8-14 and 8-9, respectively).
- ___ 4. Remove EMI filter (procedure 13).
- ___ 5. Tag and disconnect five wires attached to transformer (figure 8-14).
- ___ 6. Remove fasteners that attach transformer and support to power distribution box. Lift transformer and support from power distribution box.
- ___ 7. Detach transformer from support.
- ___ 8. Attach new transformer to support. Install transformer and support in power distribution box.
- ___ 9. Connect wires to new transformer according to tags.
- ___ 10. Reinstall EMI filter (procedure 13), power distribution box front and rear covers (figures 8-14 and 8-9, respectively), cabinet-mounted power supplies (procedure 16), and plastic baffle.
- ___ 11. Turn site wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler ON.
- ___ 12. Turn coupler power on (procedure 1).

Procedure 16. Power Supply Replacement

Refer to figure 8-2 and perform the following steps to replace either the -5 V power supply or +5 V power supply as applicable.

NOTE

The following procedures require two people.

-5 V Power Supply

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Refer to figure 8-2. Remove power cables from terminal E1 and ac input connector, and ground strap from terminal E2 at front of power supply.
- ___ 3. Remove screws that attach power supply to front mounting brackets of cabinet. Slide power supply out rear of cabinet.
- ___ 4. Install a replacement -5 V power supply by reversing the preceding steps.
- ___ 5. Apply power to coupler (procedure 1) and vary the +5 V dc and -5 V dc adjustment controls until the voltage percentage meter shows 0 percent for each adjustment.

+5 V Power Supply

- ___ 1. Turn coupler power off (procedure 1).
- ___ 2. Refer to figure 8-2. Remove cables from J1 metering, J1 ac input, and J2 connectors at front of +5 V power supply.
- ___ 3. Remove rear cover from power supply.
- ___ 4. Remove ground and power cables from terminals E3 and E4 at back of power supply.
- ___ 5. Remove four screws that attach power supply to mounting brackets at front of cabinet. Slide power supply out front of cabinet.
- ___ 6. Install a replacement +5 V power supply by reversing the preceding steps.
- ___ 7. Apply power to coupler (procedure 1) and vary the +5 V and -5 V dc adjustment controls until the voltage percentage meter shows 0 percent for each adjustment.

Procedure 17. 400-Hz Power Relay Replacement

Refer to figure 8-9 and perform the following steps to replace the 400-Hz power relay (K3) in the power distribution box.

- ___ 1. Turn coupler power OFF (procedure 1) and turn site wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler OFF. It is suggested that a notice be fastened to these circuit breakers to inform personnel not to turn breakers on.
- ___ 2. Remove cabinet-mounted power supplies (procedure 16).
- ___ 3. Remove plastic baffle and power distribution box rear cover (figure 8-9).
- ___ 4. Tag and disconnect eight wires attached to 400-Hz power relay.
- ___ 5. Remove power relay.
- ___ 6. Install a new power relay by reversing the preceding steps.

8 Procedure 18. 400-Hz Switch/Circuit Breaker Replacement

Refer to figure 8-14 and perform the following steps to replace the 400-Hz circuit breaker.

- ___ 1. Turn coupler power OFF (procedure 1) and turn site wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler OFF. It is suggested that a notice be fastened to these circuit breakers to inform personnel not to turn breakers on.
- ___ 2. Remove cabinet-mounted power supplies (procedure 16).
- ___ 3. Remove plastic baffle and power distribution box front cover (figure 8-14).
- ___ 4. Tag and disconnect eight wires attached to the 400-Hz power disconnect switch/circuit breaker.
- ___ 5. Remove the circuit breaker.
- ___ 6. Transfer diode CR3 from old circuit breaker to new one; maintain same diode polarity.
- ___ 7. Install the new circuit breaker by reversing the first 5 steps.

Procedure 19. 400-Hz Control Relay Replacement

Refer to figure 8-9 and perform the following steps to replace the 400-Hz control relay (K1).

- ___ 1. Turn coupler power OFF (procedure 1) and turn site wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler OFF. It is suggested that a notice be fastened to these circuit breakers to inform personnel not to turn breakers on.
- ___ 2. Remove cabinet-mounted power supplies (procedure 16).
- ___ 3. Remove power distribution box rear cover (figure 8-9).
- ___ 4. Remove 400-Hz control relay from socket K1.
- ___ 5. Insert a new relay by reversing the preceding steps.

Procedure 20. Diode CR1 Replacement

Refer to figure 8-9 and perform the following steps to replace diode CR1.

- ___ 1. Turn coupler power OFF (procedure 1) and turn site wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler OFF. It is suggested that a notice be fastened to these circuit breakers to inform personnel not to turn breakers on.
- ___ 2. Remove cabinet-mounted power supplies (procedure 16).
- ___ 3. Remove power distribution box rear cover (figure 8-9).
- ___ 4. Remove screws mounting relay support bracket and rotate bracket to gain access to diode CR1.
- ___ 5. Unsolder diode CR1 leads connected to TB3-2 and TB3-3.
- ___ 6. Place 12 mm (0.5 in) of sleeve insulation on each lead of new diode and trim leads to appropriate length.
- ___ 7. Solder negative (band) lead of new diode to TB3-3 and other lead to TB3-2.
- ___ 8. Mount relay support bracket to power distribution box.
- ___ 9. Install cabinet-mounted power supplies and power distribution box rear cover.
- ___ 10. Turn wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler ON, then apply power to the coupler (procedure 1).

Procedure 21. Capacitor C1 Replacement

Refer to figure 8-9 and perform the following steps to replace capacitor C1.

- ___ 1. Turn coupler power OFF (procedure 1) and turn site wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler OFF. It is suggested that a notice be fastened to these circuit breakers to inform personnel not to turn breakers on.
- ___ 2. Remove cabinet-mounted power supplies (procedure 16).
- ___ 3. Remove power distribution box rear cover (figure 8-9).
- ___ 4. Remove relay bracket mounting screws and rotate bracket to gain access to capacitor C1.
- ___ 5. Unsolder capacitor leads connected to relay socket terminals K1-1 and K1-7.
- ___ 6. Cut tie wrap and remove capacitor C1 from relay support.
- ___ 7. Attach new capacitor to relay support with tie wrap.
- ___ 8. Place sleeve insulation on each lead of new capacitor and trim lead to appropriate length.
- ___ 9. Solder negative lead of capacitor to K1-1 and positive lead to K1-7.
- ___ 10. Mount relay support bracket to power distribution box.
- ___ 11. Install cabinet-mounted power supplies and power distribution box rear cover.
- ___ 12. Turn wall-mounted 50/60-Hz and 400-Hz circuit breakers that feed the coupler ON, then apply power to coupler (procedure 1).

Procedure 22. FIPS Device Interface Connector Pin Extraction

To remove pins from the FIPS device I/O connectors, use an extractor tool (CDC part number 86732402) and perform the following steps.

- ___ 1. Move handle of extractor tool to back end of tool.
- ___ 2. Approach from front side of connector block and insert front end of extractor tool between the two prongs of connector pin.
- ___ 3. Slide handle toward front of extractor tool to release connector pin catch from connector.
- ___ 4. Remove pin through back side of connector block.
- ___ 5. Install a replacement connector pin (CDC part number 94355103) into back side of connector by hand.

Procedure 23. Logic Card Replacement

Perform the following steps to replace logic cards in the coupler logic rack.

- ___ 1. Turn 400-Hz power disconnect switch/circuit breaker OFF.
- ___ 2. Squeeze retaining fasteners on metal cover plate at front of logic chassis and swing cover plate down to access logic cards.
- ___ 3. Rotate upper and lower card cams simultaneously to disconnect card from backpanel connector.
- ___ 4. Slide card out of logic rack.
- ___ 5. Install replacement card in logic rack card slots with component side of board facing right.
- ___ 6. Position card cams into cam grooves and rotate cams simultaneously to seat card into backpanel connector.
- ___ 7. Turn 400-Hz power disconnect switch/circuit breaker ON.

Remove/Replace/Adjustment Procedures (19404-2/11)

9

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Remove/Replace/Adjustment Procedures (19404-2/11)

9

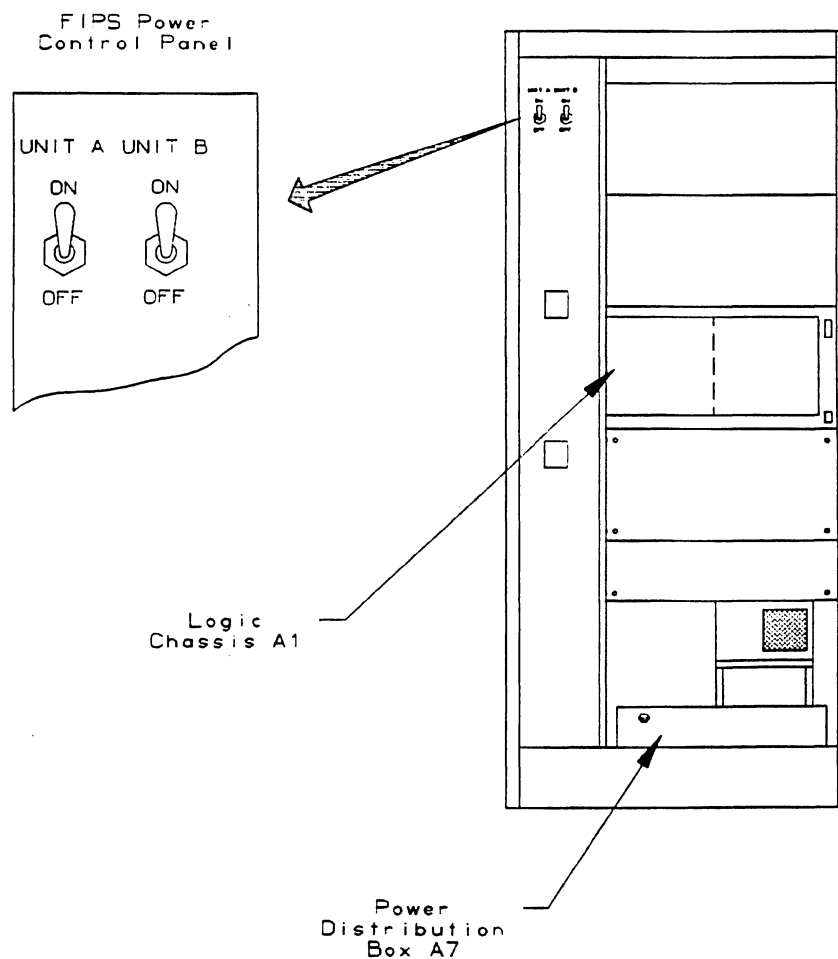
This section contains remove, replace, and adjustment procedures for 19404-2 and 19404-11 CCCs.

NOTE

The 50/60-Hz power disconnect switch/circuit breaker is referred to as component CB1 throughout this section. CB1 is located in the upper left-hand corner of power distribution box A7.

Procedure 1. Power Application/Removal

To apply power to either the coupler or peripheral devices connected to the coupler, refer to figure 9-1 and perform the following steps.



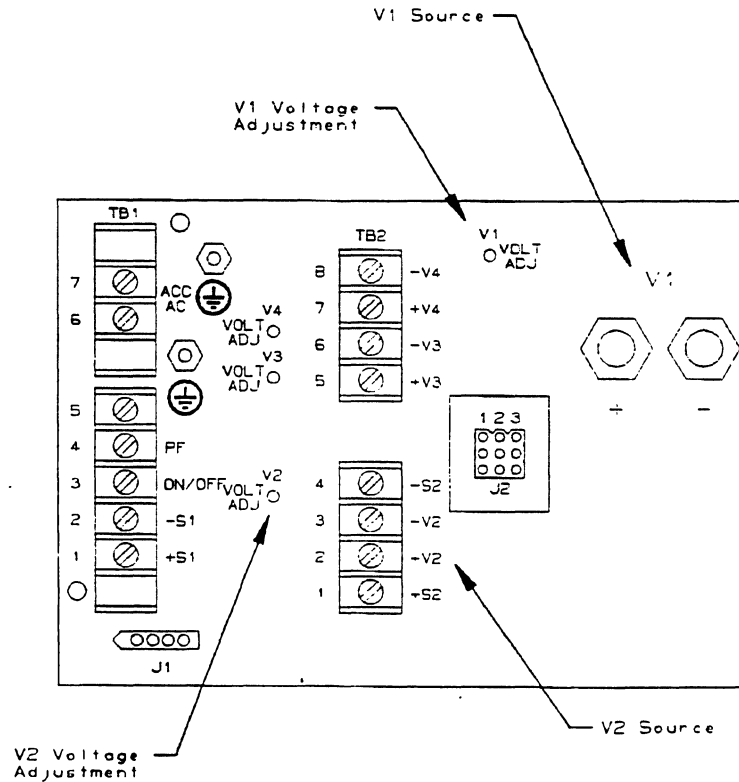
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Figure 9-1. Location of Input Power Switches

- ___ 1. To apply power to the coupler, open front cabinet door and turn CB1 ON.
- ___ 2. To remove power from the CCC, turn CB1 OFF.
- ___ 3. To apply power to the attached subsystem devices, open front cabinet door and turn power-on unit A and/or unit B switches ON as applicable.
- ___ 4. To remove power from the attached subsystem devices, turn power-on unit A and/or unit B switches OFF as applicable.

Procedure 2. Power Supply Voltage Calibration

To calibrate the coupler power supply, refer to figure 9-2 and perform the following steps.



HRM19404-03

Figure 9-2. Location of Power Supply Terminals

NOTE

The power supply is calibrated before shipment. This procedure is not required as a part of routine maintenance.

- ___ 1. Turn CB1 ON.
- ___ 2. Connect a digital dc voltmeter between the + and - terminals of V1.
- ___ 3. Turn V1 adjustment screw until the voltmeter reads $+5 \pm 0.05$ V.
- ___ 4. Transfer voltmeter leads to pins 2 and 3 of V2.
- ___ 5. Turn V2 adjustment screw until the voltmeter reads -5 ± 0.05 V.

Procedure 3. Air Filter Cleaning

To clean the cabinet input air filter, refer to figure 9-3 and perform the following steps.

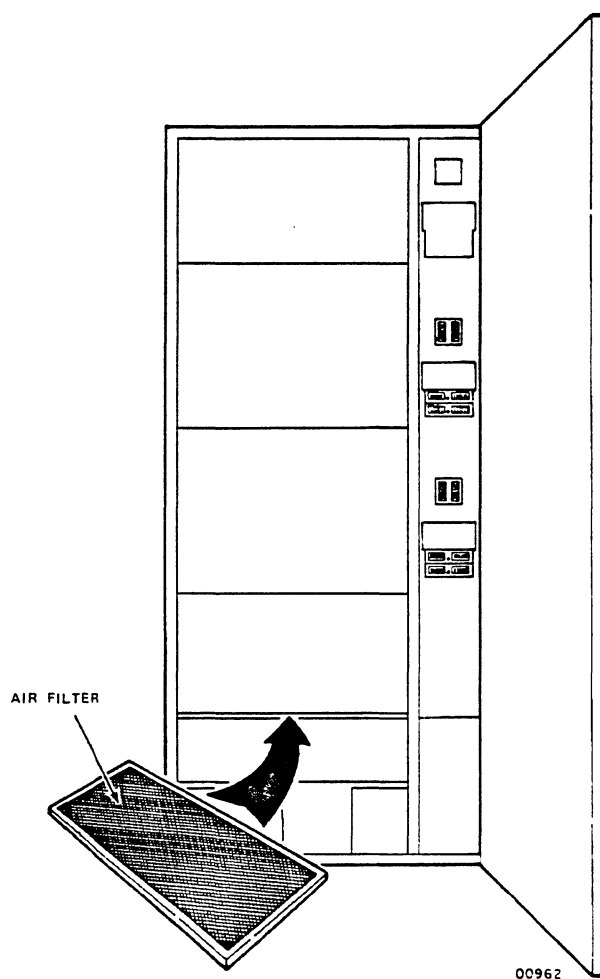


Figure 9-3. Air Filter Location

- ___ 1. Turn CB1 OFF.
- ___ 2. Open rear cabinet door and slide air filter out from its position at base of shroud.
- ___ 3. Vacuum filter from the dirty side. If filter still appears dirty after vacuuming, rinse in water, shake to remove excess water, then set aside to dry.
- ___ 4. Insert air filter in cabinet and close rear cabinet door.

Procedure 4. 50/60-Hz Power Fault Isolation

Perform the following steps to isolate 50/60-Hz power faults.

⚠ WARNING

Voltage tests in this procedure involve dangerous voltages. Do not touch exposed voltmeter leads, connector pins, or terminals.

Procedure 4.1. If neither the power supply, nor the blower is operating:

- ___ 1. Ensure that the site circuit breaker is ON.
- ___ 2. Ensure that CB1 on the front of the power distribution box is ON.
- ___ 3. If both circuit breakers are ON, but the CCC power supply (location A5) and blower still do not operate:
 - ___ a. Turn CB1 OFF.
 - ___ b. Remove the power distribution box cover directly above CB1 to reveal this combination switch/circuit breaker.
 - ___ c. Turn CB1 ON.
 - ___ d. Carefully connect an ac voltmeter between the top two leads of CB1 to test for input power.
 - ___ e. If 220/240 V is not present, the CCC is not faulty. Trace towards site circuit breaker for source of the problem. Turn CB1 OFF and replace cover.
 - ___ f. If power exists at top leads of CB1, transfer voltmeter leads to the bottom two leads to test for output power. If 220/240 V is not present, CB1 is faulty. Turn site wall circuit breaker OFF, replace CB1 according to procedure 15, then replace cover.
 - ___ g. If power exists at bottom leads of CB1, transfer voltmeter leads to the leads 3 and 4 of filter FL1.¹ If 220/240 V is not present, FL1 is faulty. Turn site wall circuit breaker and CB1 OFF, replace FL1 according to procedure 8, then replace the power distribution box covers.
 - ___ h. If power exists at leads 3 and 4 of CB1, but CCC power supply and blower still do not operate, refer to the power distribution diagrams in section 5 and troubleshoot accordingly.

1. You must remove the power distribution box cover directly above FL1 to reach leads 3 and 4.

Procedure 4.2. If the blower operates, but the power supply does not:

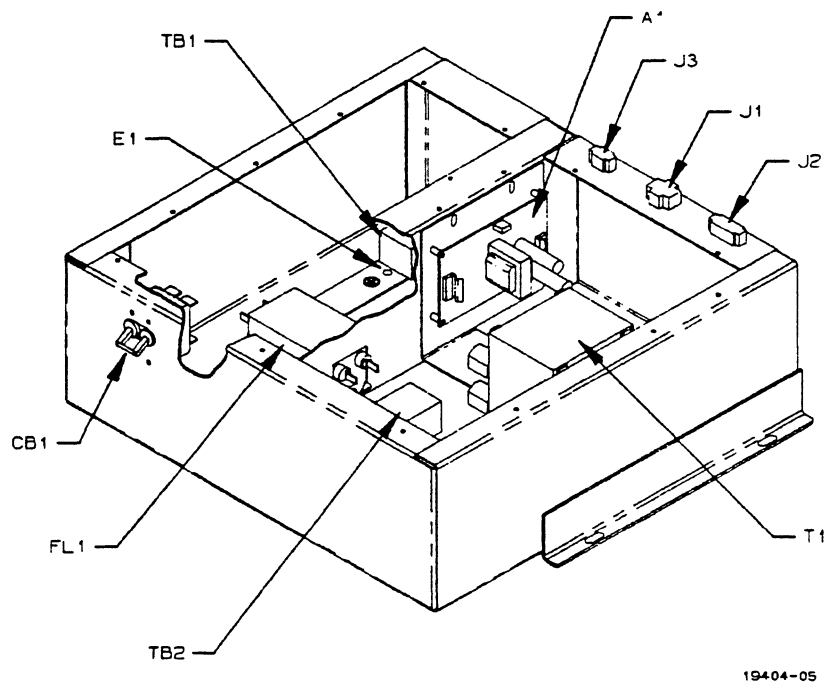


Figure 9-4. Power Distribution Box Components (Viewed from Front of Cabinet)

- ___ 1. Turn CB1 OFF.
- ___ 2. Disconnect plug P2 from J2 of the power distribution box.
- ___ 3. Turn CB1 ON.
- ___ 4. Connect an ac voltmeter between pins 1 and 2 of J2 to test for 220/240 V input power.

- ___ 5. If 220/240 V exists between pins 1 and 2:
 - ___ a. Turn CB1 OFF.
 - ___ b. Remove transparent protective cover from TB1 of power supply.
 - ___ c. Reseat plug A7P2 into A7J2, then turn CB1 ON.
 - ___ d. Connect an ac voltmeter between pins 6 and 7 of TB1 to test for input power. If 220/240 V does not exist between pins 6 and 7, the cable assembly is faulty. Replace the cable (part number 12103943).
 - ___ e. If 220/240 V exists between pins 6 and 7, but +5 Vdc does not exist at V1, attach a digital dc voltmeter between pin 3 of TB1 and the negative lead of V1.
 - ___ f. If measured voltage is less than 2.5 V, the airflow sensor is sending an abnormal signal that prevents the power supply from operating. Refer to airflow sensor fault isolation procedure (procedure 13).
 - ___ g. If measured voltage is greater than 2.5 V:
 - ___ 1) Turn CB1 OFF.
 - ___ 2) Remove both leads from V1 of power supply.
 - ___ 3) Attach a multimeter to the two wires separated from V1 and check for continuity.
 - ___ 4) If continuity exists, there is a short within the CCC. Call the next level of support.
 - ___ 5) If continuity is infinite, a short is not evident and the power supply is faulty. Replace power supply according to procedure 10.

Procedure 4.3. If the power supply operates, but the blower does not:

- ___ 1. Turn CB1 OFF.
- ___ 2. Unplug A7P1 from A7J1.
- ___ 3. Turn CB1 ON.
- ___ 4. Carefully attach an ac voltmeter between pins 1 and 2 of A7J1; 115 V should appear.
- ___ 5. If 115 V does exist between pins 1 and 2:
 - ___ a. Turn CB1 OFF.
 - ___ b. Reseat A7P1 into A7J1.
 - ___ c. Remove blower assembly cover (refer to procedure 7).
 - ___ d. Manually spin blower squirrel cage to ensure that it is not restricted from movement.
 - ___ e. Turn CB1 ON.
 - ___ f. Attach an ac voltmeter to pins 1 and 2 of TB1 (TB1 is located inside the blower housing).
 - ___ g. If 115 V does not exist, the cable assembly is faulty. Replace the cable (part number 12103951).
 - ___ h. If 115 V exists, but the blower does not operate, the blower is faulty. Replace the blower according to procedure 7.
- ___ 6. If 115 V does not exist between pins 1 and 2 of A7J1:
 - ___ a. Turn CB1 OFF.
 - ___ b. Remove power distribution box cover directly above transformer T1 to reveal the transformer.
 - ___ c. Turn CB1 ON.
 - ___ d. Carefully attach an ac voltmeter to the secondary leads of T1; 115 V should be present.
 - ___ e. If 115 V does not exist at the secondary of T1, but 220/240 V exists at the primary, T1 is faulty. Replace T1 according to procedure 9.

Procedure 5. Power-On Indicator Lamp Replacement

To replace the power-on indicator lamp, refer to figure 9-5 and perform the following steps.

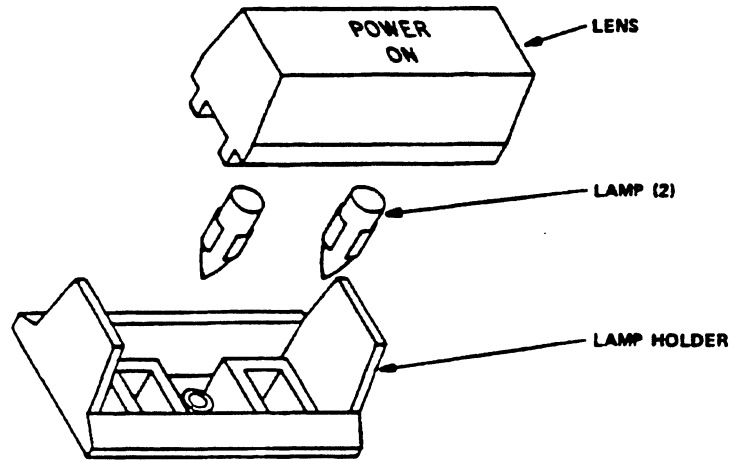


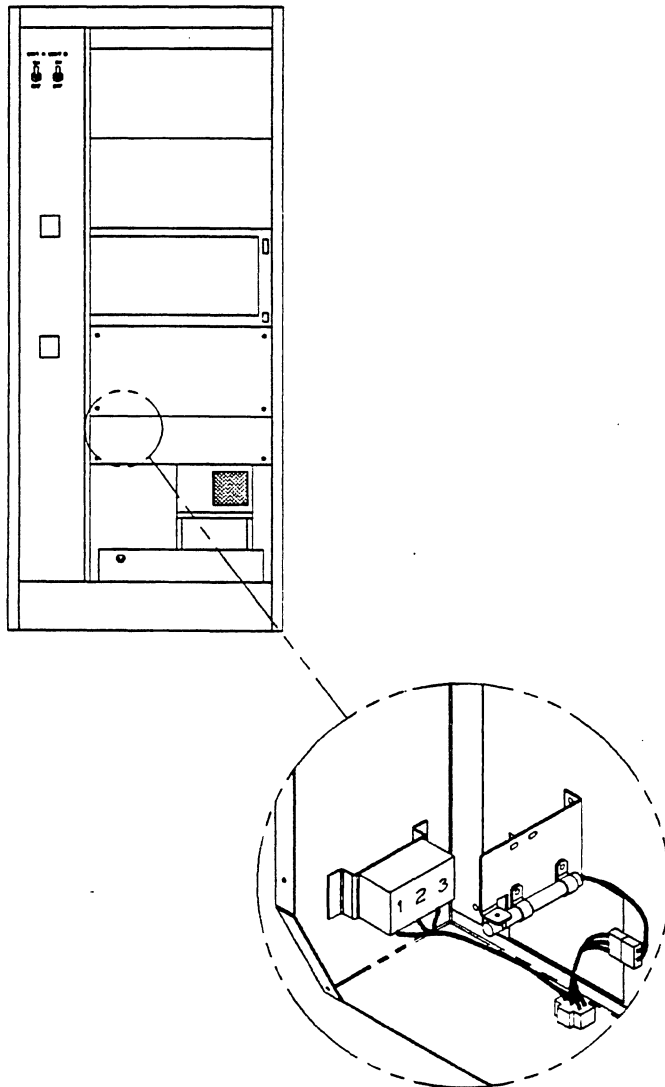
Figure 9-5. Power-On Indicator Details

- ___ 1. Turn CB1 OFF.
- ___ 2. Squeeze top and bottom of power-on lens, then pull up to release.
- ___ 3. Remove faulty lamp using long-nose pliers or tweezers.
- ___ 4. Insert new lamp and replace lens.

Procedure 6. Airflow Sensor Replacement

To replace the airflow sensor, refer to figure 9-6 and perform the following steps.

- ___ 1. Turn CB1 OFF.
- ___ 2. Remove blower assembly front cover.
- ___ 3. Unplug P2 from A1J1.
- ___ 4. Remove mounting hardware from old sensor, then remove sensor.
- ___ 5. Install a new sensor by reversing the preceding steps.



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Figure 9-6. Blower Assembly/Airflow Sensor

Procedure 7. Blower Assembly Replacement

To replace the blower assembly, perform the following steps.

- ___ 1. Turn CB1 OFF.
- ___ 2. Remove the blower assembly front cover (figure 9-6).
- ___ 3. Disconnect black, white, and green wires from TB1-1, TB1-2, and TB1-3.
- ___ 4. Detach shroud from blower assembly (figure 9-7).

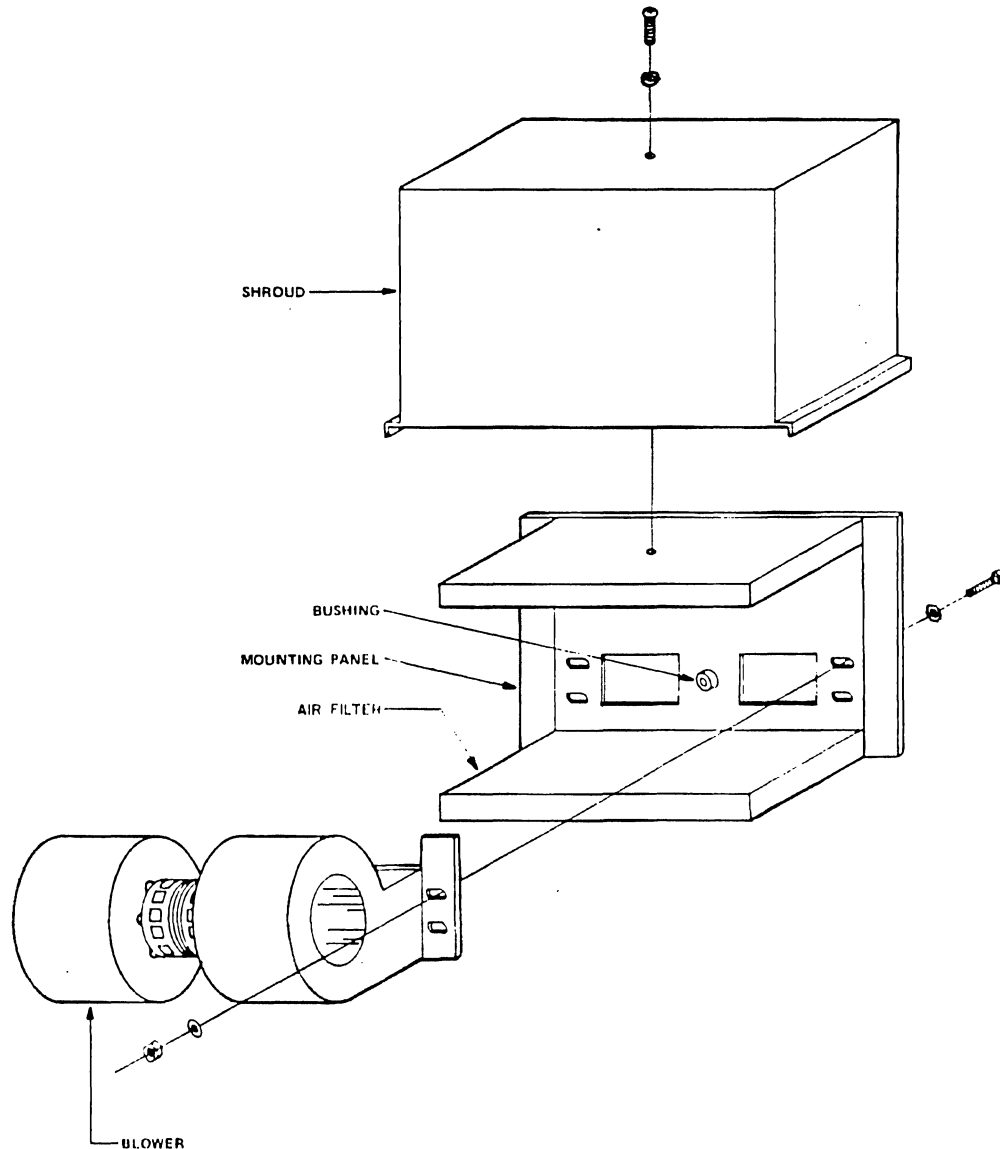


Figure 9-7. Blower, Shroud, and Mounting Panel

- ___ 5. Remove blower from its mounting panel.
- ___ 6. Pull the three blower wires through mounting panel bushing.
- ___ 7. Insert wires from new blower through bushing in mounting panel.
- ___ 8. Install new blower on mounting panel with hardware removed in step 4.
- ___ 9. Connect new blower wires to TB1 as follows.

Wire	Connection
Black	TB1-1
White	TB1-2
Green	TB1-3

- ___ 10. Reinstall blower assembly front cover and shroud (figures 9-6 and 9-7).

Procedure 8. EMI Filter Replacement

To replace the EMI filter (FL1), refer to figure 9-4 and perform the following steps.

- ___ 1. Turn CB1 OFF.
- ___ 2. Remove power distribution cover immediately above filter FL1.
- ___ 3. Tag and disconnect the four wires attached to FL1.
- ___ 4. Remove the two screws that connect FL1 to power distribution box, then remove FL1.
- ___ 5. Install new filter by reversing the previous steps.

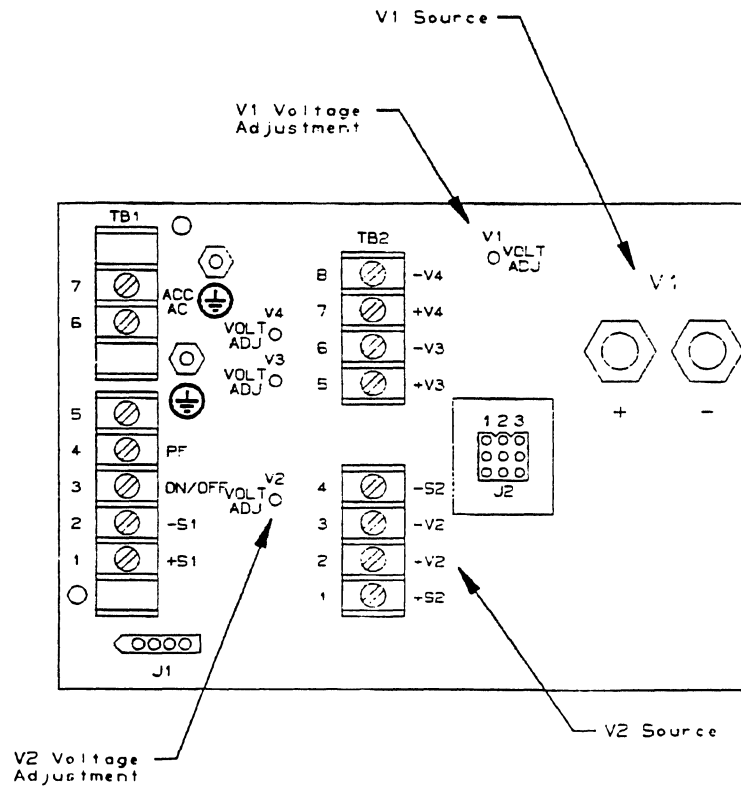
Procedure 9. Transformer Replacement

To replace transformer T1 within power distribution box A7, refer to figure 9-4 and perform the following steps.

- ___ 1. Turn CB1 OFF and disable the site wall-mounted 50/60-Hz circuit breaker that feeds the CCC. Control data recommends that a notice be fastened to the site circuit breaker to inform personnel not to turn it on.
- ___ 2. Remove power supply from CCC cabinet (refer to procedure 10).
- ___ 3. Remove the four screws that connect power distribution box to CCC cabinet, disconnect A7P1, A7P2, and A7P3 from power distribution box, then remove power distribution box from CCC cabinet.
- ___ 4. Remove power distribution box covers directly above transformer T1 to reveal the T1.
- ___ 5. Tag and disconnect the four wires attached to T1.
- ___ 6. Remove fasteners that attach T1 to power distribution box. Lift T1 from power distribution box.
- ___ 7. Install a new transformer by reversing the preceeding steps.

Procedure 10. Power Supply Replacement

To replace the CCC power supply, refer to figure 9-8 and perform the following steps.



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Figure 9-8. Location of Power Supply Terminals

- ___ 1. Turn CB1 OFF.
- ___ 2. Tag and remove the eight wires attached to the power supply.
- ___ 3. Remove screws that attach power supply to CCC cabinet, then remove power supply.
- ___ 4. Install a replacement power supply by reversing step 3, then step 2.
- ___ 5. Ensure that the 230 V plug is inserted into J1 of the power supply (as opposed to the 115 V plug)². J1 is located in the extreme, lower left-hand corner of the power supply.
- ___ 6. Turn CB1 ON.

NOTE

Although the power supply is calibrated at the factory and should not require recalibration, voltage adjustment instructions are given in procedure 2.

2. The 230 V plug has a jumper between pins 2 and 3, whereas the 115 V plug has a jumper between pins 1 and 2 and pins 3 and 4.

Procedure 11. FIPS Device Interface Connector Pin Extraction

To remove pins from the FIPS device I/O connectors, use an extractor tool (part number 86732402) and perform the following steps.

- ___ 1. Move handle of extractor device to back end of tool.
- ___ 2. Approach from front side of connector block and insert front end of extractor tool between the two prongs of connector pin.
- ___ 3. Slide handle toward front of extractor tool to release connector pin catch from connector.
- ___ 4. Remove pin through back side of connector block.
- ___ 5. Install a replacement connector pin (part number 94355103) into back side of connector by hand.

Procedure 12. Logic Card Replacement

To replace logic cards in the coupler logic rack, perform the following steps.

- ___ 1. Turn CB1 OFF.
- ___ 2. To access logic cards, squeeze retaining fasteners on metal cover plate at front of logic chassis and swing cover plate down.
- ___ 3. Rotate upper and lower card cams simultaneously to disconnect card from backpanel connector.
- ___ 4. Slide card out of logic rack.
- ___ 5. Install replacement card in logic rack card slots with component side of board facing right.
- ___ 6. Position card cams into cam grooves and rotate cams simultaneously to set card into backpanel connector.
- ___ 7. Turn CB1 ON.

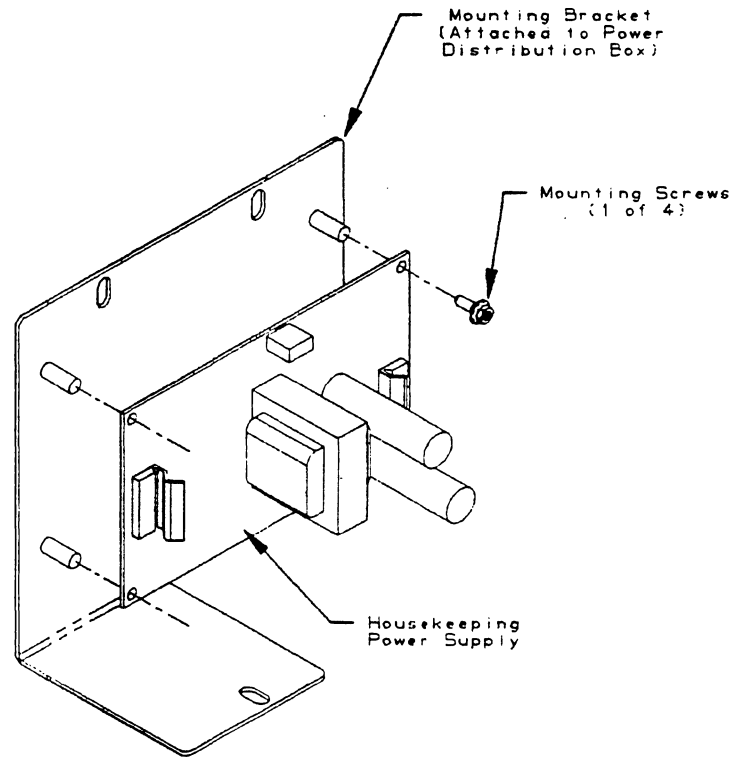
Procedure 13. Airflow Sensor Fault Isolation

To isolate airflow sensor faults, refer to figure 9-6 and perform the following steps.

- ___ 1. Turn CB1 OFF.
- ___ 2. Ensure that the air filter is not clogged (refer to procedure 3).
- ___ 3. Unplug A7P1 from A7J1.
- ___ 4. Turn CB1 ON.
- ___ 5. Attach a digital dc voltmeter between pins 3 and 4 of A7J1.
- ___ 6. If +12 V does not exist between pins 3 and 4 of A7J1, the housekeeping power supply is faulty. Replace the housekeeping power supply according to procedure 14.
- ___ 7. If +12 V exists between pins 3 and 4 of A7J1:
 - ___ a. Turn CB1 OFF.
 - ___ b. Reseat A7P1 into A7J1.
 - ___ c. Remove blower assembly front cover (refer to figure 9-6).
 - ___ d. Unplug P2 from A1J1.
 - ___ e. Turn CB1 ON.
 - ___ f. Attach a digital dc voltmeter between pins 2 and 3 of P2.
 - ___ g. If +12 V exists between pins 2 and 3 of P2:
 - ___ 1) Attach voltmeter leads between pins P2-3 (negative lead) and P2-1 (positive lead).
 - ___ 2) If the measured voltage is less than 2.5 V, the airflow sensor is faulty. Replace the sensor according to procedure 6.
 - ___ h. If +12 V does not exist between pins 2 and 3 of P2, check the continuity of wire assembly 12103951. Replace if necessary.

Procedure 14. Housekeeping Power Supply Replacement

To replace the housekeeping power supply, refer to figure 9-9 and perform the following steps. Refer to figure 9-4 for the location of this component within power distribution box A7.



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Figure 9-9. Housekeeping Power Supply

- ___ 1. Turn CB1 OFF and disable the site wall-mounted 50/60-Hz circuit breaker that feeds the CCC. Control Data recommends that a notice be fastened to the site circuit breaker to inform personnel not to turn it on.
- ___ 2. Remove power distribution cover immediately above housekeeping power supply.
- ___ 3. Disconnect the two wire assemblies plugged into housekeeping power supply.
- ___ 4. Remove the four screws that attach housekeeping power supply to power distribution box, then remove the power supply.
- ___ 5. Install a replacement housekeeping power supply by reversing the first four steps.

Procedure 15. CB1 Replacement

To replace CB1³, perform the following steps. Refer to figure 9-4 for the location of this component.

- ___ 1. Turn CB1 OFF and disable the site wall-mounted 50/60-Hz circuit breaker that feeds the CCC. Control Data suggests that a notice be fastened to the site circuit breaker to inform personnel not to turn it on.
- ___ 2. Remove power distribution cover immediately above CB1.
- ___ 3. Tag and disconnect the four wires attached to CB1.
- ___ 4. Remove the four screws that attach CB1 to power distribution box, then remove CB1.
- ___ 5. Install a replacement switch/circuit breaker by reversing the preceding steps.

3. CB1 is the same as the 50/60-Hz power disconnect switch/circuit breaker.

Parts Data

10

19404-1/10 CYBER Channel Coupler Spare Parts List	10-2
19404-2/11 CYBER Channel Coupler Spare Parts List	10-3

This chapter contains the recommended replaceable electrical parts for the CYBER channel coupler.

19404-1/10 CYBER Channel Coupler Spare Parts List

PART NUMBER	DESCRIPTION
00815469	FILTER WASHABLE
00816700	BLOWER 523 C.F.M.
10284353	(RISK) PCB ASSY-MEMORY CR
10285797	PCB ASSY-MAINT CR
18287502	DIODE, SILICON DIFFUSED JUNCTIO
18440702	CKT BREAKER 4 POLE AUX SWITCH
18565200	RELAY, 25AMP(3P SINGLE THROW)
18752831	CONNECTOR, COAXIAL MULTIPLE POS
18874300	MARKER, IDENT-CABLE STRAP
18890003	CAP FXD ALUM 40VDC 750 UF
19191600	I/O COAXIAL CABLE ASSY
22179490	PC BD ASSY-CY DATA BUS I/F
22647109	WIRE ELEC TP 30GA KYNAR BLK/WT
23140103	PRINTED CKT BD ASSY-CYB CH I/F
24550802	RELAY, OCTAL SOCKET
24567000	CABLE, COAXIAL 19 COND., 730HM
24571702	SWITCH TOGGLE TWO POSITION SP
51713900	LIGHT, NEON INDICATOR 1/3 WATT
51731101	CIRCUIT BREAKER 2 AMP
51808104	SWITCH THERMAL 120 VAC 130 F
53590866	PRINTED CKT BD ASSY-FIP #3
53915602	AIR FLOW SENSOR ASSY
53973800	TRANSFORMER STEP DOWN .75KVA
67310400	PWR SUPPLY ASSY MASTER 5V 100A
67310600	POWER SUPPLY ASSY 5V 10AMP
94380204	INDICATOR-ILLUMINATED PANEL
94380400	LAMP-INCANDESCENT, MINIATURE
94380800	LENS-LETTERED
96744777	FILTER-RFI LOW LEAKAGE
97022400	SWITCH-TOGGLE, 3PDT
10285797	MOD ASSY-MAINTENANCE BOARD
10283690	MOD ASSY-FIPS INTERFACE IV
53590866	MOD ASSY-FIPS INTERFACE III
10283554	MOD ASSY-FIPS INTERFACE II
12107787	MOD ASSY-STREAM LOGIC
10304457	MOD ASSY-FIPS INTERFACE (UDI)
10283570	MOD ASSY-TRANSFER LOGIC
10283566	MOD ASSY-MEMORY
10292489	MOD ASSY-PROCESSOR CONTROL
53595819	MOD ASSY-PROCESSOR ALU
22137381	MOD ASSY-CYBER INTERFACE (STATUS/CLOCKS)
12107866	MOD ASSY-CYBER INTERFACE (UDI)
12168320	MOD ASSY-CYBER INTERFACE (DATA BUS)
12107874	MOD ASSY-CYBER INTERFACE (CHANNEL)

19404-2/11 CYBER Channel Coupler Spare Parts List

PART NUMBER	DESCRIPTION
00815469	FILTER WASHABLE
00816700	BLOWER 523 C.F.M.
10354778	C/A PWR LIGHT
12103943	C/A A7J2
12103944	C/A A7J3
12103951	C/A A7J1
15473314	POWER SUPPLY
56590722	POWER CORD (60 HZ)
15005183	CIRCUIT BREAKER
15469770	HOUSEKEEPING POWER SUP.
15473287	FILTER
15473316	TRANSFORMER
93418330	FUSE
10309827	AIRFLOW SENSOR
10283690	MOD ASSY-FIPS INTERFACE IV
53590866	MOD ASSY-FIPS INTERFACE III
10283554	MOD ASSY-FIPS INTERFACE II
12107787	MOD ASSY-STREAM LOGIC
10304457	MOD ASSY-FIPS INTERFACE (UDI)
10283570	MOD ASSY-TRANSFER LOGIC
10283566	MOD ASSY-MEMORY
10292489	MOD ASSY-PROCESSOR CONTROL
53595819	MOD ASSY-PROCESSOR ALU
22137381	MOD ASSY-CYBER INTERFACE (STATUS/CLOCKS)
12107866	MOD ASSY-CYBER INTERFACE (UDI)
12168320	MOD ASSY-CYBER INTERFACE (DATA BUS)
12107874	MOD ASSY-CYBER INTERFACE (CHANNEL)

Wire Lists

11

Logic Chassis Wire List 11-2

Cable Tabs 11-124

1

This chapter contains the logic-chassis wire list or cross tabs for the backpanel and cable tab listings for the input/output (I/O) cables. The cross tabs show the physical backpanel wiring destinations for each logic module pin. The cable tabs list the cable connections between the backpanel and the Federal Information Processing Standard (FIPS) device and CYBER channel I/O connectors.

Logic Chassis Wire List

The following pages contain logic chassis wire lists for the 19404-1/2/3/10/11/12 CYBER Channel Coupler.

PAGE 1 PACK A01 60000496 REV A

DATE 90/01/19

ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A01-1A03/1C03	11	A04-2B03/2D03	11	8	A04B53			01				
A01-1A04/1C04	11	A03-1B04/1D04	11	5	A04B72			01				
A01-1A07/1C07	11	A04-1A04/1C04	11	13	A04A04			01				
A01-1A08/1C08	11	A10-1A08/1C08	11	8	A10A08			01				
A01-1A09/1C09	11	A10-1A12/1C12	11	8	A10A12			01				
A01-1A10/1C10	11	A10-1A10/1C10	11	8	A10A10			01				
A01-1A14/1C14	11	A04-2A08/2C08	11	8	A01A14			01				
A01-1A19/1C19	11	A04-2B17/2D17	11	8	A04B67			01				
A01-1A20/1C20	11	A04-1A36/1C36	11	6	A01A20			01				
A01-1A22/1C22	11	A04-1A33/1C33	11	6	A04A33			01				
A01-1A29/1C29	11	A04-2A05/2C05	11	6	A01A29			01				
A01-1A35/1C35	11	A04-1A34/1C34	11	5	A02A74			01				
A01-1A37/1C37	11	A02-1A37/1C37	11	4	A01A37			01				
A01-1A38/1C38	11	A02-1A38/1C38	11	4	A01A38			01				
A01-1A40/1C40	11	A02-1A40/1C40	11	4	A01A40			01				
A01-1A41/1C41	11	A02-1A41/1C41	11	4	A01A41			01				
A01-1A42/1C42	11	A02-1A42/1C42	11	4	A01A42			01				
A01-1A43/1C43	11	A02-1A43/1C43	11	4	A01A43			01				
A01-1B03/1D03	11	A04-1B43/1D43	11	7	A01B03			01				
A01-1B04/1D04	11	A04-1A41/1C41	11	7	A01B04			01				
A01-1B14/1D14	11	A04-2A07/2C07	11	8	A01B14			01				
A01-1B15/1D15	11	A02-2A42/2C42	11	11	A01B15			01				
A01-1B19/1D19	11	A02-2B30/2D30	11	9	A01B19			01				
A01-1B22/1D22	11	A04-2B16/2D16	11	8	A04B66			01				
A01-1B29/1D29	11	A02-2A41/2C41	11	9	A01B29			01				
A01-1B30/1D30	11	A02-2B32/2D32	11	8	A01B30			01				
A01-1B37/1D37	11	A02-1B37/1D37	11	4	A01B37			01				

DATE 90/01/19

PAGE 2 PACK AO1 60000496 REV A

ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
AO1-1B38/1D38	11	AO2-1B38/1D38	11	4	AO1B38			01				
AO1-1B40/1D40	11	AO2-1B40/1D40	11	4	AO1B40			01				
AO1-1B41/1D41	11	AO2-1B41/1D41	11	4	AO1B41			01				
AO1-1B42/1D42	11	AO2-1B42/1D42	11	4	AO1B42			01				
AO1-1B43/1D43	11	AO2-1B43/1D43	11	4	AO1B43			01				
AO1-2A04/2C04	11	AO4-2B10/2D10	11	6	AO4B60			01				
AO1-2A09/2C09	11	AO4-2A27/2C27	11	6	AO1A59			01				
AO1-2A15/----		AO1-2C15/----			GRNDXX			01				
AO1-2A19/----		AO1-2C19/----			GRNDXX			01				
AO1-2A27/----		AO1-2C27/----			GRNDXX			01				
AO1-2A31/----		AO1-2C31/----			GRNDXX			01				
AO1-2A35/----		AO1-2C35/----			GRNDXX			01				
AO1-2A43/----		AO1-2C43/----			GRNDXX			01				
AO1-2B04/2D04	11	AO2-2A36/2C36	11	6	AO1B54			01				
AO1-2B09/2D09	11	AO2-2A38/2C38	11	6	AO4A74			01				
AO1-2B10/2D10	11	AO4-2B25/2D25	11	6	AO4B75			01				
AO1-2B13/2D13	11	AO4-2A21/2C21	11	5	AO1B63			01				
AO1-2B14/2D14	11	A10-1A11/1C11	11	10	A10A11			01				
AO1-2B15/----		AO1-2D15/----			GRNDXX			01				
AO1-2B19/----		AO1-2D19/----			GRNDXX			01				
AO1-2B27/----		AO1-2D27/----			GRNDXX			01				
AO1-2B31/----		AO1-2D31/----			GRNDXX			01				
AO1-2B35/----		AO1-2D35/----			GRNDXX			01				
AO1-2B43/----		AO1-2D43/----			GRNDXX			01				

PAGE	3	PACK	AO2 60000496 REV A										DATE 90/01/18	
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
AO2-1A03/1C03	11	AO4-1A03/1C03	11	13	AO4A03			01						
AO2-1A04/1C04	11	AO4-2B09/2D09	11	13	AO4B59			01						
AO2-1A05/1C05	11	AO4-1A05/1C05	11	13	AO4A05			01						
AO2-1A08*1C08	11	AO4-1A08/1C08	11	5	AO4A08			01						
AO2-1A09*1C09	11	AO4-1A09/1C09	11	5	AO4A09			01						
AO2-1A10*1C10	11	AO4-1A10/1C10	11	5	AO4A10			01						
AO2-1A11*1C11	11	AO4-1A11/1C11	11	5	AO4A11			01						
AO2-1A12*1C12	11	AO4-1A12/1C12	11	5	AO4A12			01						
AO2-1A13*1C13	11	AO4-1A13/1C13	11	5	AO4A13			01						
AO2-1A14*1C14	11	AO4-1A14/1C14	11	5	AO4A14			01						
AO2-1A15*1C15	11	AO4-1A15/1C15	11	5	AO4A15			01						
AO2-1A16*1C16	11	AO4-1A16/1C16	11	5	AO4A16			01						
AO2-1A19/1C19	11	AO4-1B42/1D42	11	6	AO2A19			01						
AO2-1A20/1C20	11	AO8-2A32/2C32	11	10	AO8A82			01						
AO2-1A21/1C21	11	AO4-2A14/2C14	11	8	AO4A64			01						
AO2-1A24/1C24	11	AO3-1A24/1C24	11	4	AO3A24			01						
AO2-1A25/1C25	11	AO3-1A25/1C25	11	4	AO3A25			01						
AO2-1A26/1C26	11	AO3-1A26/1C26	11	4	AO3A26			01						
AO2-1A27/1C27	11	AO3-1A27/1C27	11	4	AO3A27			01						
AO2-1A28/1C28	11	AO3-1A28/1C28	11	4	AO3A28			01						
AO2-1A29/1C29	11	AO3-1A29/1C29	11	4	AO3A29			01						
AO2-1A30/1C30	11	AO3-1A30/1C30	11	4	AO3A30			01						
AO2-1A31/1C31	11	AO3-1A31/1C31	11	4	AO3A31			01						
AO2-1A35/1C35	11	AO4-2B07/2D07	11	6	AO4B57			01						
AO2-1A37/1C37	11	AO1-1A37/1C37	11	4	AO1A37			01						
AO2-1A38/1C38	11	AO1-1A38/1C38	11	4	AO1A38			01						

PAGE	4	PACK	AO2 60000496 REV A										DATE 90/01/19	
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A02-1A40/1C40	11	A01-1A40/1C40	11	4	A01A40			01						
A02-1A41/1C41	11	A01-1A41/1C41	11	4	A01A41			01						
A02-1A42/1C42	11	A01-1A42/1C42	11	4	A01A42			01						
A02-1A43/1C43	11	A01-1A43/1C43	11	4	A01A43			01						
A02-1B03/1D03	11	A04-1B03/1D03	11	13	A04B03			01						
A02-1B04/1D04	11	A04-2B42/2D42	11	13	A02B04			01						
A02-1B08*1D08	11	A04-1B08/1D08	11	5	A04B08			01						
A02-1B09*1D09	11	A04-1B09/1D09	11	5	A04B09			01						
A02-1B10*1D10	11	A04-1B10/1D10	11	5	A04B10			01						
A02-1B11*1D11	11	A04-1B11/1D11	11	5	A04B11			01						
A02-1B12*1D12	11	A04-1B12/1D12	11	5	A04B12			01						
A02-1B13*1D13	11	A04-1B13/1D13	11	5	A04B13			01						
A02-1B14*1D14	11	A04-1B14/1D14	11	5	A04B14			01						
A02-1B15*1D15	11	A04-1B15/1D15	11	5	A04B15			01						
A02-1B16*1D16	11	A04-1B16/1D16	11	5	A04B16			01						
A02-1B24/1D24	11	A03-1B24/1D24	11	4	A03B24			01						
A02-1B25/1D25	11	A03-1B25/1D25	11	4	A03B25			01						
A02-1B26/1D26	11	A03-1B26/1D26	11	4	A03B26			01						
A02-1B27/1D27	11	A03-1B27/1D27	11	4	A03B27			01						
A02-1B28/1D28	11	A03-1B28/1D28	11	4	A03B28			01						
A02-1B29/1D29	11	A03-1B29/1D29	11	4	A03B29			01						
A02-1B30/1D30	11	A03-1B30/1D30	11	4	A03B30			01						
A02-1B31/1D31	11	A03-1B31/1D31	11	4	A03B31			01						
A02-1B36/1D36	11	A08-2A17/2C17	11	8	A02B36			01						
A02-1B36/1D36	22	A11-2B26/2D26	22	10	A02B36			01						
A02-1B37/1D37	11	A01-1B37/1D37	11	4	A01B37			01						
A02-1B38/1D38	11	A01-1B38/1D38	11	4	A01B38			01						
A02-1B40/1D40	11	A01-1B40/1D40	11	4	A01B40			01						
A02-1B41/1D41	11	A01-1B41/1D41	11	4	A01B41			01						

PAGE	5	PACK	A02 60000496 REV A										DATE 90/01/19		
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A02-1B42/1D42	11	A01-1B42/1D42	11	4	A01B42			01							
A02-1B43/1D43	11	A01-1B43/1D43	11	4	A01B43			01							
A02-2A03/2C03	11	A03-2B20/2D20	11	5	A03B70			01							
A02-2A07/2C07	11	A03-2A07/2C07	11	4	A03A57			01							
A02-2A08/2C08	11	A03-2A08/2C08	11	4	A03A58			01							
A02-2A09/2C09	11	A03-2A09/2C09	11	4	A03A59			01							
A02-2A10/2C10	11	A03-2A10/2C10	11	4	A03A60			01							
A02-2A11/2C11	11	A03-2A11/2C11	11	4	A03A61			01							
A02-2A12/2C12	11	A03-2A12/2C12	11	4	A03A62			01							
A02-2A13/2C13	11	A03-2A13/2C13	11	4	A03A63			01							
A02-2A14/2C14	11	A03-2A14/2C14	11	4	A03A64			01							
A02-2A20/2C20	11	A04-2A26/2C26	11	5	A02A70			01							
A02-2A21/2C21	11	A09-2B19/2D19	11	7	A09B69			01							
A02-2A22/2C22	11	A04-1A43/1C43	11	6	A04A43			01							
A02-2A24/2C24	22	A04-1A34/1C34	22	7	A02A74			01							
A02-2A25/2C25	11	A04-2A03/2C03	11	6	A04A53			01							
A02-2A26/2C26	11	A03-2B34/2D34	11	5	A03B84			01							
A02-2A34*2C34	11	A04-2A34/2C34	11	5	A04A84			01							
A02-2A36/2C36	11	A01-2B04/2D04	11	6	A01B54			01							
A02-2A37/2C37	11	A04-2A20/2C20	11	6	A04A70			01							
A02-2A38/2C38	11	A01-2B09/2D09	11	6	A04A74			01							
A02-2A38/2C38	22	A04-2A24/2C24	22	5	A04A74			01							
A02-2A40/2C40	11	A04-2A15/2C15	11	6	A04A65			01							
A02-2A41/2C41	11	A01-1B29/1D29	11	9	A01B29			01							
A02-2A41/2C41	22	A04-1B35/1D35	22	9	A01B29			01							
A02-2A42/2C42	11	A01-1B15/1D15	11	11	A01B15			01							
A02-2A43/2C43	11	A03-2A25/2C25	11	5	A03A75			01							
A02-2B04/2D04	11	A03-1B35/1D35	11	6	A03B35			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A02-2B07/2D07	11	A03-2B07/2D07	11	4	A03B57			01						
A02-2B08/2D08	11	A03-2B08/2D08	11	4	A03B58			01						
A02-2B09/2D09	11	A03-2B09/2D09	11	4	A03B59			01						
A02-2B10/2D10	11	A03-2B10/2D10	11	4	A03B60			01						
A02-2B11/2D11	11	A03-2B11/2D11	11	4	A03B61			01						
A02-2B12/2D12	11	A03-2B12/2D12	11	4	A03B62			01						
A02-2B13/2D13	11	A03-2B13/2D13	11	4	A03B63			01						
A02-2B14/2D14	11	A03-2B14/2D14	11	4	A03B64			01						
A02-2B15/2D15	11	A03-1A35/1C35	11	6	A03A35			01						
A02-2B16/2D16	11	A04-1B36/1D36	11	6	A02B66			01						
A02-2B17/2D17	11	A04-2B18/2D18	11	5	A04B68			01						
A02-2B18/2D18	11	A03-2A22/2C22	11	4	A03A72			01						
A02-2B19/2D19	11	A08-1B37/1D37	11	8	A08B37			01						
A02-2B27/2D27	11	A04-2A04/2C04	11	6	A02B77			01						
A02-2B28/2D28	11	A04-2B15/2D15	11	5	A08B54			01						
A02-2B29/2D29	11	A04-2B04/2D04	11	6	A02B79			01						
A02-2B30/2D30	11	A01-1B19/1D19	11	9	A01B19			01						
A02-2B31/2D31	11	A03-2B21/2D21	11	5	A03B71			01						
A02-2B32/2D32	11	A01-1B30/1D30	11	8	A01B30			01						
A02-2B32/2D32	22	A04-2B05/2D05	22	6	A01B30			01						
A02-2B33*2D33	11	A04-2B33/2D33	11	5	A04B83			01						
A02-2B34*2D34	11	A04-2B34/2D34	11	5	A04B84			01						
A02-2B35/2D35	22	A04-2A05/2C05	22	6	A01A29			01						
A02-2B37/2D37	22	A04-1B17/1D17	22	10	A03A83			01						
A02-2B42/2D42	22	A04-1A36/1C36	22	9	A01A20			01						
A02-2B43/2D43	11	A04-1A35/1C35	11	9	A02B93			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A03-1A12/1C12	11	A04-1A40/1C40	11	6	A04A40			01							
A03-1A13/1C13	11	A03-1B34/1D34	11	6	A03B34			01							
A03-1A24/1C24	11	A02-1A24/1C24	11	4	A03A24			01							
A03-1A24/1C24	22	A04-1A24/1C24	22	4	A03A24			01							
A03-1A25/1C25	11	A02-1A25/1C25	11	4	A03A25			01							
A03-1A25/1C25	22	A04-1A25/1C25	22	4	A03A25			01							
A03-1A26/1C26	11	A02-1A26/1C26	11	4	A03A26			01							
A03-1A26/1C26	22	A04-1A26/1C26	22	4	A03A26			01							
A03-1A27/1C27	11	A02-1A27/1C27	11	4	A03A27			01							
A03-1A27/1C27	22	A04-1A27/1C27	22	4	A03A27			01							
A03-1A28/1C28	11	A02-1A28/1C28	11	4	A03A28			01							
A03-1A28/1C28	22	A04-1A28/1C28	22	4	A03A28			01							
A03-1A29/1C29	11	A02-1A29/1C29	11	4	A03A29			01							
A03-1A29/1C29	22	A04-1A29/1C29	22	4	A03A29			01							
A03-1A30/1C30	11	A02-1A30/1C30	11	4	A03A30			01							
A03-1A30/1C30	22	A04-1A30/1C30	22	4	A03A30			01							
A03-1A31/1C31	11	A02-1A31/1C31	11	4	A03A31			01							
A03-1A31/1C31	22	A04-1A31/1C31	22	4	A03A31			01							
A03-1A32/1C32	11	A04-2B29/2D29	11	8	A04B79			01							
A03-1A34/1C34	11	A04-1B22/1D22	11	5	A03A34			01							
A03-1A35/1C35	11	A02-2B15/2D15	11	6	A03A35			01							
A03-1A43/1C43	11	A04-1B38/1D38	11	4	A03A43			01							
A03-1B03/1D03	11	A03-2B24/2D24	11	10	A03B74			01							
A03-1B04/1D04	11	A01-1A04/1C04	11	5	A04B72			01							
A03-1B04/1D04	22	A03-2A34/2C34	22	11	A04B72			01							
A03-1B24/1D24	11	A02-1B24/1D24	11	4	A03B24			01							
A03-1B24/1D24	22	A04-1B24/1D24	22	4	A03B24			01							
A03-1B25/1D25	11	A02-1B25/1D25	11	4	A03B25			01							
A03-1B25/1D25	22	A04-1B25/1D25	22	4	A03B25			01							
A03-1B26/1D26	11	A02-1B26/1D26	11	4	A03B26			01							
A03-1B26/1D26	22	A04-1B26/1D26	22	4	A03B26			01							
A03-1B27/1D27	11	A02-1B27/1D27	11	4	A03B27			01							
A03-1B27/1D27	22	A04-1B27/1D27	22	4	A03B27			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A03-1B28/1D28	11	A02-1B28/1D28	11	4	A03B28			01								
A03-1B28/1D28	22	A04-1B28/1D28	22	4	A03B28			01								
A03-1B29/1D29	11	A02-1B29/1D29	11	4	A03B29			01								
A03-1B29/1D29	22	A04-1B29/1D29	22	4	A03B29			01								
A03-1B30/1D30	11	A02-1B30/1D30	11	4	A03B30			01								
A03-1B30/1D30	22	A04-1B30/1D30	22	4	A03B30			01								
A03-1B31/1D31	11	A02-1B31/1D31	11	4	A03B31			01								
A03-1B31/1D31	22	A04-1B31/1D31	22	4	A03B31			01								
A03-1B33/1D33	11	A04-2A28/2C28	11	8	A03B33			01								
A03-1B34/1D34	11	A03-1A13/1C13	11	6	A03B34			01								
A03-1B35/1D35	11	A02-2B04/2D04	11	6	A03B35			01								
A03-2A03/2C03	11	A04-2A13/2C13	11	5	A04A63			01								
A03-2A05/2C05	11	A04-1A38/1C38	11	6	A03A55			01								
A03-2A07/2C07	11	A02-2A07/2C07	11	4	A03A57			01								
A03-2A08/2C08	11	A02-2A08/2C08	11	4	A03A58			01								
A03-2A09/2C09	11	A02-2A09/2C09	11	4	A03A59			01								
A03-2A10/2C10	11	A02-2A10/2C10	11	4	A03A60			01								
A03-2A11/2C11	11	A02-2A11/2C11	11	4	A03A61			01								
A03-2A12/2C12	11	A02-2A12/2C12	11	4	A03A62			01								
A03-2A13/2C13	11	A02-2A13/2C13	11	4	A03A63			01								
A03-2A14/2C14	11	A02-2A14/2C14	11	4	A03A64			01								
A03-2A17/2C17	11	A04-1A42/1C42	11	6	A04A42			01								
A03-2A20/2C20	11	A04-2A25/2C25	11	4	A03A70			01								
A03-2A21/2C21	11	A04-1B34/1D34	11	7	A03A71			01								
A03-2A22/2C22	11	A02-2B18/2D18	11	4	A03A72			01								
A03-2A25/2C25	11	A02-2A43/2C43	11	5	A03A75			01								
A03-2A26/2C26	11	A10-1A09/1C09	11	11	A03A76			01								
A03-2A27/2C27	11	A04-2A18/2C18	11	5	A03A77			01								
A03-2A30*2C30	11	A04-2A30/2C30	11	4	A04A80			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A03-2A31*2C31	11	A04-2A31/2C31	11	4	A04A81			01								
A03-2A32/2C32	11	A04-1B41/1D41	11	7	A04B41			01								
A03-2A33/2C33	11	A04-1B17/1D17	11	10	A03A83			01								
A03-2A34/2C34	11	A04-2B22/2D22	11	5	A04B72			01								
A03-2A34/2C34	22	A03-1B04/1D04	22	11	A04B72			01								
A03-2A35*2C35	11	A05-2A35/2C35	11	5	A03A85			01								
A03-2A36*2C36	11	A05-2A36/2C36	11	5	A03A86			01								
A03-2A37*2C37	11	A05-2A37/2C37	11	5	A03A87			01								
A03-2A38*2C38	11	A05-2A38/2C38	11	5	A03A88			01								
A03-2A40*2C40	11	A05-2A40/2C40	11	5	A03A90			01								
A03-2A41*2C41	11	A05-2A41/2C41	11	5	A03A91			01								
A03-2A42*2C42	11	A05-2A42/2C42	11	5	A03A92			01								
A03-2A43*2C43	11	A05-2A43/2C43	11	5	A03A93			01								
A03-2B07/2D07	11	A02-2B07/2D07	11	4	A03B57			01								
A03-2B08/2D08	11	A02-2B08/2D08	11	4	A03B58			01								
A03-2B09/2D09	11	A02-2B09/2D09	11	4	A03B59			01								
A03-2B10/2D10	11	A02-2B10/2D10	11	4	A03B60			01								
A03-2B11/2D11	11	A02-2B11/2D11	11	4	A03B61			01								
A03-2B12/2D12	11	A02-2B12/2D12	11	4	A03B62			01								
A03-2B13/2D13	11	A02-2B13/2D13	11	4	A03B63			01								
A03-2B14/2D14	11	A02-2B14/2D14	11	4	A03B64			01								
A03-2B20/2D20	11	A02-2A03/2C03	11	5	A03B70			01								
A03-2B21/2D21	11	A02-2B31/2D31	11	5	A03B71			01								
A03-2B22/2D22	11	A04-1A17/1C17	11	9	A03B72			01								
A03-2B24/2D24	11	A03-1B03/1D03	11	10	A03B74			01								
A03-2B25/2D25	11	A07-1B31/1D31	11	8	A03B75			01								
A03-2B26/2D26	11	A04-2B24/2D24	11	4	A03B76			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A03-2B27/2D27	11	A04-2A19/2C19	11	4	A03B77			01				
A03-2B30*2D30	11	A04-2B30/2D30	11	4	A04B80			01				
A03-2B31*2D31	11	A04-2B31/2D31	11	4	A04B81			01				
A03-2B33/2D33	11	A04-2B12/2D12	11	6	A03B83			01				
A03-2B34/2D34	11	A02-2A26/2C26	11	5	A03B84			01				
A03-2B34/2D34	22	A04-2A09/2C09	22	6	A03B84			01				
A03-2B35*2D35	11	A05-2B35/2D35	11	5	A03B85			01				
A03-2B36*2D36	11	A05-2B36/2D36	11	5	A03B86			01				
A03-2B37*2D37	11	A05-2B37/2D37	11	5	A03B87			01				
A03-2B38*2D38	11	A05-2B38/2D38	11	5	A03B88			01				
A03-2B40*2D40	11	A05-2B40/2D40	11	5	A03B90			01				
A03-2B41*2D41	11	A05-2B41/2D41	11	5	A03B91			01				
A03-2B42*2D42	11	A05-2B42/2D42	11	5	A03B92			01				
A03-2B43*2D43	11	A05-2B43/2D43	11	5	A03B93			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A04-1A03/1C03	11	A02-1A03/1C03	11	13	A04A03			01								
A04-1A04/1C04	11	A01-1A07/1C07	11	13	A04A04			01								
A04-1A05/1C05	11	A02-1A05/1C05	11	13	A04A05			01								
A04-1A07/1C07	11	A10-1A07/1C07	11	13	A04A07			01								
A04-1A08/1C08	11	A02-1A08*1C08	11	5	A04A08			01								
A04-1A08/1C08	22	A05-1A08/1C08	22	4	A04A08			01								
A04-1A09/1C09	11	A02-1A09*1C09	11	5	A04A09			01								
A04-1A09/1C09	22	A05-1A09/1C09	22	4	A04A09			01								
A04-1A10/1C10	11	A02-1A10*1C10	11	5	A04A10			01								
A04-1A10/1C10	22	A05-1A10/1C10	22	4	A04A10			01								
A04-1A11/1C11	11	A02-1A11*1C11	11	5	A04A11			01								
A04-1A11/1C11	22	A05-1A11/1C11	22	4	A04A11			01								
A04-1A12/1C12	11	A02-1A12*1C12	11	5	A04A12			01								
A04-1A12/1C12	22	A05-1A12/1C12	22	4	A04A12			01								
A04-1A13/1C13	11	A02-1A13*1C13	11	5	A04A13			01								
A04-1A13/1C13	22	A05-1A13/1C13	22	4	A04A13			01								
A04-1A14/1C14	11	A02-1A14*1C14	11	5	A04A14			01								
A04-1A14/1C14	22	A05-1A14/1C14	22	4	A04A14			01								
A04-1A15/1C15	11	A02-1A15*1C15	11	5	A04A15			01								
A04-1A15/1C15	22	A05-1A15/1C15	22	4	A04A15			01								
A04-1A16/1C16	11	A02-1A16*1C16	11	5	A04A16			01								
A04-1A16/1C16	22	A05-1A16/1C16	22	4	A04A16			01								
A04-1A17/1C17	11	A03-2B22/2D22	11	9	A03B72			01								
A04-1A22/1C22	22	A09-2B19/2D19	22	9	A09B69			01								
A04-1A24/1C24	22	A03-1A24/1C24	22	4	A03A24			01								
A04-1A25/1C25	22	A03-1A25/1C25	22	4	A03A25			01								
A04-1A26/1C26	22	A03-1A26/1C26	22	4	A03A26			01								
A04-1A27/1C27	22	A03-1A27/1C27	22	4	A03A27			01								
A04-1A28/1C28	22	A03-1A28/1C28	22	4	A03A28			01								
A04-1A29/1C29	22	A03-1A29/1C29	22	4	A03A29			01								
A04-1A30/1C30	22	A03-1A30/1C30	22	4	A03A30			01								

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	AO4-1A31/1C31	22	AO3-1A31/1C31	22	4	A03A31			01						
	AO4-1A32/1C32	11	A11-1B04/1D04	11	13	A04A32			01						
	AO4-1A33/1C33	11	AO1-1A22/1C22	11	6	A04A33			01						
	AO4-1A34/1C34	11	AO1-1A35/1C35	11	5	A02A74			01						
	AO4-1A34/1C34	22	AO2-2A24/2C24	22	7	A02A74			01						
	AO4-1A35/1C35	11	AO2-2B43/2D43	11	9	A02B93			01						
	AO4-1A36/1C36	11	AO1-1A20/1C20	11	6	A01A20			01						
	AO4-1A36/1C36	22	AO2-2B42/2D42	22	9	A01A20			01						
	AO4-1A37/1C37	11	A10-1B05/1D05	11	13	A04A37			01						
	AO4-1A38/1C38	11	AO3-2A05/2C05	11	6	A03A55			01						
	AO4-1A40/1C40	11	AO3-1A12/1C12	11	6	A04A40			01						
	AO4-1A41/1C41	11	AO1-1B04/1D04	11	7	A01B04			01						
	AO4-1A42/1C42	11	AO3-2A17/2C17	11	6	A04A42			01						
	AO4-1A43/1C43	11	AO2-2A22/2C22	11	6	A04A43			01						
	AO4-1B03/1D03	11	AO2-1B03/1D03	11	13	A04B03			01						
	AO4-1B04/1D04	11	AO6-1B04/1D04	11	13	A04B04			01						
	AO4-1B05/1D05	11	AO7-1B05/1D05	11	13	A04B05			01						
	AO4-1B08/1D08	11	AO2-1B08*1D08	11	5	A04B08			01						
	AO4-1B08/1D08	22	AO5-1B08/1D08	22	4	A04B08			01						
	AO4-1B09/1D09	11	AO2-1B09*1D09	11	5	A04B09			01						
	AO4-1B09/1D09	22	AO5-1B09/1D09	22	4	A04B09			01						
	AO4-1B10/1D10	11	AO2-1B10*1D10	11	5	A04B10			01						
	AO4-1B10/1D10	22	AO5-1B10/1D10	22	4	A04B10			01						
	AO4-1B11/1D11	11	AO2-1B11*1D11	11	5	A04B11			01						
	AO4-1B11/1D11	22	AO5-1B11/1D11	22	4	A04B11			01						
	AO4-1B12/1D12	11	AO2-1B12*1D12	11	5	A04B12			01						
	AO4-1B12/1D12	22	AO5-1B12/1D12	22	4	A04B12			01						
	AO4-1B13/1D13	11	AO2-1B13*1D13	11	5	A04B13			01						
	AO4-1B13/1D13	22	AO5-1B13/1D13	22	4	A04B13			01						
	AO4-1B14/1D14	11	AO2-1B14*1D14	11	5	A04B14			01						
	AO4-1B14/1D14	22	AO5-1B14/1D14	22	4	A04B14			01						

PAGE	13	PACK	A04 60000496 REV A			DATE 90/01/19								
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A04-1B15/1D15	11	A02-1B15*1D15	11	5	A04B15			01						
A04-1B15/1D15	22	A05-1B15/1D15	22	4	A04B15			01						
A04-1B16/1D16	11	A02-1B16*1D16	11	5	A04B16			01						
A04-1B16/1D16	22	A05-1B16/1D16	22	4	A04B16			01						
A04-1B17/1D17	11	A03-2A33/2C33	11	10	A03A83			01						
A04-1B17/1D17	22	A02-2B37/2D37	22	10	A03A83			01						
A04-1B22/1D22	11	A03-1A34/1C34	11	5	A03A34			01						
A04-1B24/1D24	22	A03-1B24/1D24	22	4	A03B24			01						
A04-1B25/1D25	22	A03-1B25/1D25	22	4	A03B25			01						
A04-1B26/1D26	22	A03-1B26/1D26	22	4	A03B26			01						
A04-1B27/1D27	22	A03-1B27/1D27	22	4	A03B27			01						
A04-1B28/1D28	22	A03-1B28/1D28	22	4	A03B28			01						
A04-1B29/1D29	22	A03-1B29/1D29	22	4	A03B29			01						
A04-1B30/1D30	22	A03-1B30/1D30	22	4	A03B30			01						
A04-1B31/1D31	22	A03-1B31/1D31	22	4	A03B31			01						
A04-1B32/1D32	11	A10-2B26/2D26	11	9	A04B32			01						
A04-1B33/1D33	11	A14-1B04/1D04	11	13	A04B33			01						
A04-1B34/1D34	11	A03-2A21/2C21	11	7	A03A71			01						
A04-1B35/1D35	22	A02-2A41/2C41	22	9	A01B29			01						
A04-1B36/1D36	11	A02-2B16/2D16	11	6	A02B66			01						
A04-1B37/1D37	11	A07-1A07/1C07	11	13	A04A07			01						
A04-1B38/1D38	11	A03-1A43/1C43	11	4	A03A43			01						
A04-1B40/1D40	11	A07-1A34/1C34	11	5	A07A34			01						
A04-1B41/1D41	11	A03-2A32/2C32	11	7	A04B41			01						
A04-1B42/1D42	11	A02-1A19/1C19	11	6	A02A19			01						
A04-1B43/1D43	11	A01-1B03/1D03	11	7	A01B03			01						
A04-2A03/2C03	11	A02-2A25/2C25	11	6	A04A53			01						
A04-2A04/2C04	11	A02-2B27/2D27	11	6	A02B77			01						
A04-2A05/2C05	11	A01-1A29/1C29	11	6	A01A29			01						

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBI	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	AO4-2A05/2C05	22	AO2-2B35/2D35	22	6	AO1A29			01						
	AO4-2A07/2C07	11	AO1-1B14/1D14	11	8	AO1B14			01						
	AO4-2A08/2C08	11	AO1-1A14/1C14	11	8	AO1A14			01						
	AO4-2A09/2C09	11	AO8-2B16/2D16	11	6	AO3B84			01						
	AO4-2A09/2C09	22	AO3-2B34/2D34	22	6	AO3B84			01						
	AO4-2A10/2C10	11	AO6-1A04/1C04	11	13	AO4A60			01						
	AO4-2A11/2C11	11	AO8-1A04/1C04	11	13	AO4A61			01						
	AO4-2A12/2C12	11	A14-1A04/1C04	11	13	AO4A62			01						
	AO4-2A13/2C13	11	AO3-2A03/2C03	11	5	AO4A63			01						
	AO4-2A14/2C14	11	AO2-1A21/1C21	11	8	AO4A64			01						
	AO4-2A15/2C15	11	AO2-2A40/2C40	11	6	AO4A65			01						
	AO4-2A16/2C16	11	AO8-1B03/1D03	11	13	AO4A66			01						
	AO4-2A17/2C17	11	AO6-2B14/2D14	11	5	AO6B64			01						
	AO4-2A18/2C18	11	AO3-2A27/2C27	11	5	AO3A77			01						
	AO4-2A19/2C19	11	AO3-2B27/2D27	11	4	AO3B77			01						
	AO4-2A20/2C20	11	AO2-2A37/2C37	11	6	AO4A70			01						
	AO4-2A21/2C21	11	AO1-2B13/2D13	11	5	AO1B63			01						
	AO4-2A22/2C22	11	AO7-1A38/1C38	11	7	AO7A38			01						
	AO4-2A24/2C24	22	AO2-2A38/2C38	22	5	AO4A74			01						
	AO4-2A25/2C25	11	AO3-2A20/2C20	11	4	AO3A70			01						
	AO4-2A26/2C26	11	AO2-2A20/2C20	11	5	AO2A70			01						
	AO4-2A27/2C27	11	AO1-2A09/2C09	11	6	AO1A59			01						
	AO4-2A28/2C28	11	AO3-1B33/1D33	11	8	AO3B33			01						
	AO4-2A29/2C29	11	AO8-1B05/1D05	11	13	AO4A79			01						
	AO4-2A30/2C30	11	AO3-2A30*2C30	11	4	AO4A80			01						
	AO4-2A30/2C30	22	AO6-2A30/2C30	22	5	AO4A80			01						
	AO4-2A31/2C31	11	AO3-2A31*2C31	11	4	AO4A81			01						
	AO4-2A31/2C31	22	AO6-2A31/2C31	22	5	AO4A81			01						
	AO4-2A32/2C32	11	AO6-1A05/1C05	11	13	AO4A82			01						

PAGE	15	PACK	A04 60000496 REV A										DATE 90/01/19			
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A04-2A33/2C33	11	A11-1A05/1C05	11	13	A04A83			01								
A04-2A34/2C34	11	A02-2A34*2C34	11	5	A04A84			01								
A04-2A34/2C34	22	A05-2A34/2C34	22	4	A04A84			01								
A04-2B03/2D03	11	A01-1A03/1C03	11	8	A04B53			01								
A04-2B04/2D04	11	A02-2B29/2D29	11	6	A02B79			01								
A04-2B05/2D05	22	A02-2B32/2D32	22	6	A01B30			01								
A04-2B07/2D07	11	A02-1A35/1C35	11	6	A04B57			01								
A04-2B08/2D08	11	A08-1B35/1D35	11	6	A08B35			01								
A04-2B09/2D09	11	A02-1A04/1C04	11	13	A04B59			01								
A04-2B10/2D10	11	A01-2A04/2C04	11	6	A04B60			01								
A04-2B11/2D11	11	A11-1A04/1C04	11	13	A04B61			01								
A04-2B12/2D12	11	A03-2B33/2D33	11	6	A03B83			01								
A04-2B13/2D13	11	A06-1B03/1D03	11	13	A04B63			01								
A04-2B14/2D14	11	A07-1B03/1D03	11	13	A04B64			01								
A04-2B15/2D15	11	A02-2B28/2D28	11	5	A08B54			01								
A04-2B15/2D15	22	A08-2B04/2D04	22	6	A08B54			01								
A04-2B16/2D16	11	A01-1B22/1D22	11	8	A04B66			01								
A04-2B17/2D17	11	A01-1A19/1C19	11	8	A04B67			01								
A04-2B18/2D18	11	A02-2B17/2D17	11	5	A04B68			01								
A04-2B19/2D19	11	A11-1B03/1D03	11	13	A04B69			01								
A04-2B20/2D20	11	A14-1B03/1D03	11	13	A04B70			01								
A04-2B21/2D21	11	A06-1A03/1C03	11	13	A04B71			01								
A04-2B22/2D22	11	A03-2A34/2C34	11	5	A04B72			01								
A04-2B24/2D24	11	A03-2B26/2D26	11	4	A03B76			01								
A04-2B25/2D25	11	A01-2B10/2D10	11	6	A04B75			01								
A04-2B26/2D26	11	A08-1A03/1C03	11	13	A04B76			01								
A04-2B27/2D27	11	A11-1A03/1C03	11	13	A04B77			01								



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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A04-2B28/2D28	11	A14-1A03/1C03	11	13	A04B78			01								
A04-2B29/2D29	11	A03-1A32/1C32	11	8	A04B79			01								
A04-2B30/2D30	11	A03-2B30*2D30	11	4	A04B80			01								
A04-2B30/2D30	22	A06-2B30/2D30	22	5	A04B80			01								
A04-2B31/2D31	11	A03-2B31*2D31	11	4	A04B81			01								
A04-2B31/2D31	22	A06-2B31/2D31	22	5	A04B81			01								
A04-2B32*2D32	11	A06-2B32/2D32	11	5	A04B82			01								
A04-2B33/2D33	11	A02-2B33*2D33	11	5	A04B83			01								
A04-2B33/2D33	22	A05-2B33/2D33	22	4	A04B83			01								
A04-2B34/2D34	11	A02-2B34*2D34	11	5	A04B84			01								
A04-2B34/2D34	22	A05-2B34/2D34	22	4	A04B84			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A05-1A07/1C07	11	A06-1B10/1D10	11	4	A06B10			01				
A05-1A08/1C08	11	A07-1A08/1C08	11	5	A04A08			01				
A05-1A08/1C08	22	A04-1A08/1C08	22	4	A04A08			01				
A05-1A09/1C09	11	A07-1A09/1C09	11	5	A04A09			01				
A05-1A09/1C09	22	A04-1A09/1C09	22	4	A04A09			01				
A05-1A10/1C10	11	A07-1A10/1C10	11	5	A04A10			01				
A05-1A10/1C10	22	A04-1A10/1C10	22	4	A04A10			01				
A05-1A11/1C11	11	A07-1A11/1C11	11	5	A04A11			01				
A05-1A11/1C11	22	A04-1A11/1C11	22	4	A04A11			01				
A05-1A12/1C12	11	A07-1A12/1C12	11	5	A04A12			01				
A05-1A12/1C12	22	A04-1A12/1C12	22	4	A04A12			01				
A05-1A13/1C13	11	A07-1A13/1C13	11	5	A04A13			01				
A05-1A13/1C13	22	A04-1A13/1C13	22	4	A04A13			01				
A05-1A14/1C14	11	A07-1A14/1C14	11	5	A04A14			01				
A05-1A14/1C14	22	A04-1A14/1C14	22	4	A04A14			01				
A05-1A15/1C15	11	A07-1A15/1C15	11	5	A04A15			01				
A05-1A15/1C15	22	A04-1A15/1C15	22	4	A04A15			01				
A05-1A16/1C16	11	A07-1A16/1C16	11	5	A04A16			01				
A05-1A16/1C16	22	A04-1A16/1C16	22	4	A04A16			01				
A05-1A17/1C17	11	A06-1A17/1C17	11	4	A06A17			01				
A05-1A18/1C18	11	A06-1A18/1C18	11	4	A06A18			01				
A05-1A19/1C19	11	A06-1A19/1C19	11	4	A06A19			01				
A05-1A20/1C20	11	A06-1A20/1C20	11	4	A05A20			01				
A05-1A21/1C21	11	A06-1A21/1C21	11	4	A06A21			01				
A05-1A22/1C22	11	A06-1A22/1C22	11	4	A06A22			01				
A05-1A24/1C24	11	A06-1A24/1C24	11	4	A06A24			01				
A05-1A25/1C25	11	A06-1A25/1C25	11	4	A06A25			01				
A05-1A26/1C26	11	A06-1A26/1C26	11	4	A06A26			01				
A05-1A27/1C27	11	A06-1A27/1C27	11	4	A06A27			01				
A05-1A28/1C28	11	A06-1A28/1C28	11	4	A06A28			01				
A05-1A29/1C29	11	A06-1A29/1C29	11	4	A06A29			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A05-1A30/1C30	11	A06-1A30/1C30	11	4	A05A30			01				
A05-1A31/1C31	11	A06-1A31/1C31	11	4	A05A31			01				
A05-1A32/1C32	11	A06-1A32/1C32	11	4	A05A32			01				
A05-1A33/1C33	11	A06-1A33/1C33	11	4	A05A33			01				
A05-1A34/1C34	11	A06-1A34/1C34	11	4	A05A34			01				
A05-1A35/1C35	11	A06-1A35/1C35	11	4	A05A35			01				
A05-1A36/1C36	11	A06-1A36/1C36	11	4	A05A36			01				
A05-1A37/1C37	11	A06-1A37/1C37	11	4	A05A37			01				
A05-1A38/1C38	11	A06-1A38/1C38	11	4	A05A38			01				
A05-1A40/1C40	11	A06-1A40/1C40	11	4	A06A40			01				
A05-1A41/1C41	11	A06-1A41/1C41	11	4	A06A41			01				
A05-1A42/1C42	11	A06-1A42/1C42	11	4	A05A42			01				
A05-1A43/1C43	11	A06-1A43/1C43	11	4	A06A43			01				
A05-1B08/1D08	11	A07-1B08/1D08	11	5	A04B08			01				
A05-1B08/1D08	22	A04-1B08/1D08	22	4	A04B08			01				
A05-1B09/1D09	11	A07-1B09/1D09	11	5	A04B09			01				
A05-1B09/1D09	22	A04-1B09/1D09	22	4	A04B09			01				
A05-1B10/1D10	11	A07-1B10/1D10	11	5	A04B10			01				
A05-1B10/1D10	22	A04-1B10/1D10	22	4	A04B10			01				
A05-1B11/1D11	11	A07-1B11/1D11	11	5	A04B11			01				
A05-1B11/1D11	22	A04-1B11/1D11	22	4	A04B11			01				
A05-1B12/1D12	11	A07-1B12/1D12	11	5	A04B12			01				
A05-1B12/1D12	22	A04-1B12/1D12	22	4	A04B12			01				
A05-1B13/1D13	11	A07-1B13/1D13	11	5	A04B13			01				
A05-1B13/1D13	22	A04-1B13/1D13	22	4	A04B13			01				
A05-1B14/1D14	11	A07-1B14/1D14	11	5	A04B14			01				
A05-1B14/1D14	22	A04-1B14/1D14	22	4	A04B14			01				
A05-1B15/1D15	11	A07-1B15/1D15	11	5	A04B15			01				
A05-1B15/1D15	22	A04-1B15/1D15	22	4	A04B15			01				
A05-1B16/1D16	11	A07-1B16/1D16	11	5	A04B16			01				
A05-1B16/1D16	22	A04-1B16/1D16	22	4	A04B16			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A05-1B17/1D17	11	A06-1B17/1D17	11	4	A06B17			01						
A05-1B18/1D18	11	A06-1B18/1D18	11	4	A06B18			01						
A05-1B19/1D19	11	A06-1B19/1D19	11	4	A06B19			01						
A05-1B20/1D20	11	A06-1B20/1D20	11	4	A05B20			01						
A05-1B21/1D21	11	A06-1B21/1D21	11	4	A05B21			01						
A05-1B22/1D22	11	A06-1B22/1D22	11	4	A06B22			01						
A05-1B24/1D24	11	A06-1B24/1D24	11	4	A06B24			01						
A05-1B25/1D25	11	A06-1B25/1D25	11	4	A06B25			01						
A05-1B26/1D26	11	A06-1B26/1D26	11	4	A06B26			01						
A05-1B27/1D27	11	A06-1B27/1D27	11	4	A06B27			01						
A05-1B28/1D28	11	A06-1B28/1D28	11	4	A06B28			01						
A05-1B29/1D29	11	A06-1B29/1D29	11	4	A06B29			01						
A05-1B30/1D30	11	A06-1B30/1D30	11	4	A05B30			01						
A05-1B31/1D31	11	A06-1B31/1D31	11	4	A05B31			01						
A05-1B32/1D32	11	A06-1B32/1D32	11	4	A05B32			01						
A05-1B33/1D33	11	A06-1B33/1D33	11	4	A05B33			01						
A05-1B34/1D34	11	A06-1B34/1D34	11	4	A05B34			01						
A05-1B35/1D35	11	A06-1B35/1D35	11	4	A05B35			01						
A05-1B36/1D36	11	A06-1B36/1D36	11	4	A05B36			01						
A05-1B37/1D37	11	A06-1B37/1D37	11	4	A05B37			01						
A05-1B38/1D38	11	A06-1B38/1D38	11	4	A05B38			01						
A05-1B40/1D40	11	A06-1B40/1D40	11	4	A06B40			01						
A05-1B41/1D41	11	A06-1B41/1D41	11	4	A06B41			01						
A05-1B42/1D42	11	A06-1B42/1D42	11	4	A05B42			01						
A05-1B43/1D43	11	A06-1B43/1D43	11	4	A06B43			01						
A05-2A03/2C03	11	A06-2A03/2C03	11	4	A06A53			01						
A05-2A04/2C04	11	A06-2A04/2C04	11	4	A06A54			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A05-2A05/2C05	11	A06-2A05/2C05	11	4	A06A55			01				
A05-2A07/2C07	11	A06-2A07/2C07	11	4	A06A57			01				
A05-2A08/2C08	11	A06-2A08/2C08	11	4	A06A58			01				
A05-2A09/2C09	11	A06-2A09/2C09	11	4	A05A59			01				
A05-2A10/2C10	11	A06-2A10/2C10	11	4	A06A60			01				
A05-2A11/2C11	11	A06-2A11/2C11	11	4	A06A61			01				
A05-2A12/2C12	11	A06-2A12/2C12	11	4	A05A62			01				
A05-2A13/2C13	11	A05-2B13/2D13	11	4	A08B38			01				
A05-2A14/2C14	11	A05-2B14/2D14	11	4	A08B38			01				
A05-2A14/2C14	22	A05-2B13/2D13	22	4	A08B38			01				
A05-2A15/2C15	11	A05-2B15/2D15	11	4	A08B38			01				
A05-2A15/2C15	22	A05-2B14/2D14	22	4	A08B38			01				
A05-2A16/2C16	11	A05-2B16/2D16	11	4	A08B38			01				
A05-2A16/2C16	22	A05-2B15/2D15	22	4	A08B38			01				
A05-2A17/2C17	11	A05-2B17/2D17	11	4	A08B38			01				
A05-2A17/2C17	22	A05-2B16/2D16	22	4	A08B38			01				
A05-2A18/2C18	11	A05-2B18/2D18	11	4	A08B38			01				
A05-2A18/2C18	22	A05-2B17/2D17	22	4	A08B38			01				
A05-2A19/2C19	11	A05-2B19/2D19	11	4	A08B38			01				
A05-2A19/2C19	22	A05-2B18/2D18	22	4	A08B38			01				
A05-2A20/2C20	11	A05-2B20/2D20	11	4	A08B38			01				
A05-2A20/2C20	22	A05-2B19/2D19	22	4	A08B38			01				
A05-2A21/2C21	11	A06-2A21/2C21	11	4	A06A71			01				
A05-2A22/2C22	11	A06-2A22/2C22	11	4	A06A72			01				
A05-2A24/2C24	11	A06-2A24/2C24	11	4	A06A74			01				
A05-2A25/2C25	11	A14-1B19/1D19	11	11	A05A75			01				
A05-2A26/2C26	11	A14-1B18/1D18	11	11	A05A76			01				
A05-2A27/2C27	11	A06-2A27/2C27	11	4	A06A77			01				
A05-2A28/2C28	11	A06-2A28/2C28	11	4	A06A78			01				
A05-2A33/2C33	11	A06-1A10/1C10	11	10	A06A10			01				
A05-2A34/2C34	11	A07-2A34/2C34	11	5	A04A84			01				

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DATE 90/01/19

ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A05-2A34/2C34	22	A04-2A34/2C34	22	4	A04A84			01				
A05-2A35/2C35	11	A03-2A35*2C35	11	5	A03A85			01				
A05-2A35/2C35	22	A07-2A35/2C35	22	5	A03A85			01				
A05-2A36/2C36	11	A03-2A36*2C36	11	5	A03A86			01				
A05-2A36/2C36	22	A07-2A36/2C36	22	5	A03A86			01				
A05-2A37/2C37	11	A03-2A37*2C37	11	5	A03A87			01				
A05-2A37/2C37	22	A07-2A37/2C37	22	5	A03A87			01				
A05-2A38/2C38	11	A03-2A38*2C38	11	5	A03A88			01				
A05-2A38/2C38	22	A07-2A38/2C38	22	5	A03A88			01				
A05-2A40/2C40	11	A03-2A40*2C40	11	5	A03A90			01				
A05-2A40/2C40	22	A07-2A40/2C40	22	5	A03A90			01				
A05-2A41/2C41	11	A03-2A41*2C41	11	5	A03A91			01				
A05-2A41/2C41	22	A07-2A41/2C41	22	5	A03A91			01				
A05-2A42/2C42	11	A03-2A42*2C42	11	5	A03A92			01				
A05-2A42/2C42	22	A07-2A42/2C42	22	5	A03A92			01				
A05-2A43/2C43	11	A03-2A43*2C43	11	5	A03A93			01				
A05-2A43/2C43	22	A07-2A43/2C43	22	5	A03A93			01				
A05-2B03/2D03	11	A06-2B03/2D03	11	4	A06B53			01				
A05-2B04/2D04	11	A06-2B04/2D04	11	4	A06B54			01				
A05-2B05/2D05	11	A06-2B05/2D05	11	4	A06B55			01				
A05-2B07/2D07	11	A06-2B07/2D07	11	4	A06B57			01				
A05-2B08/2D08	11	A06-2B08/2D08	11	4	A06B58			01				
A05-2B09/2D09	11	A06-2B09/2D09	11	4	A05B59			01				
A05-2B10/2D10	11	A06-2B10/2D10	11	4	A06B60			01				
A05-2B11/2D11	11	A06-2B11/2D11	11	4	A06B61			01				
A05-2B12/2D12	11	A06-2B12/2D12	11	4	A05B62			01				
A05-2B13/2D13	11	A05-2A13/2C13	11	4	A08B38			01				
A05-2B13/2D13	22	A05-2A14/2C14	22	4	A08B38			01				
A05-2B14/2D14	11	A05-2A14/2C14	11	4	A08B38			01				
A05-2B14/2D14	22	A05-2A15/2C15	22	4	A08B38			01				
A05-2B15/2D15	11	A05-2A15/2C15	11	4	A08B38			01				
A05-2B15/2D15	22	A05-2A16/2C16	22	4	A08B38			01				
A05-2B16/2D16	11	A05-2A16/2C16	11	4	A08B38			01				

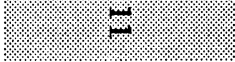
PAGE	22	PACK	A05 60000496 REV A				DATE 90/01/19								
	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	A05-2B16/2D16	22	A05-2A17/2C17	22	4	A08B38			01						
	A05-2B17/2D17	11	A05-2A17/2C17	11	4	A08B38			01						
	A05-2B17/2D17	22	A05-2A18/2C18	22	4	A08B38			01						
	A05-2B18/2D18	11	A05-2A18/2C18	11	4	A08B38			01						
	A05-2B18/2D18	22	A05-2A19/2C19	22	4	A08B38			01						
	A05-2B19/2D19	11	A05-2A19/2C19	11	4	A08B38			01						
	A05-2B19/2D19	22	A05-2A20/2C20	22	4	A08B38			01						
	A05-2B20/2D20	11	A05-2A20/2C20	11	4	A08B38			01						
	A05-2B20/2D20	22	A08-1B38/1D38	22	7	A08B38			01						
	A05-2B21/2D21	11	A06-2B21/2D21	11	4	A06B71			01						
	A05-2B22/2D22	11	A06-2B22/2D22	11	4	A06B72			01						
	A05-2B24/2D24	11	A06-2B24/2D24	11	4	A05B74			01						
	A05-2B25/2D25	11	A14-1A19/1C19	11	11	A05B75			01						
	A05-2B26/2D26	11	A14-1A18/1C18	11	11	A05B76			01						
	A05-2B27/2D27	11	A06-2B27/2D27	11	4	A06B77			01						
	A05-2B28/2D28	11	A06-2B28/2D28	11	4	A05B78			01						
	A05-2B33/2D33	11	A07-2B33/2D33	11	5	A04B83			01						
	A05-2B33/2D33	22	A04-2B33/2D33	22	4	A04B83			01						
	A05-2B34/2D34	11	A07-2B34/2D34	11	5	A04B84			01						
	A05-2B34/2D34	22	A04-2B34/2D34	22	4	A04B84			01						
	A05-2B35/2D35	11	A03-2B35*2D35	11	5	A03B85			01						
	A05-2B35/2D35	22	A07-2B35/2D35	22	5	A03B85			01						
	A05-2B36/2D36	11	A03-2B36*2D36	11	5	A03B86			01						
	A05-2B36/2D36	22	A07-2B36/2D36	22	5	A03B86			01						
	A05-2B37/2D37	11	A03-2B37*2D37	11	5	A03B87			01						
	A05-2B37/2D37	22	A07-2B37/2D37	22	5	A03B87			01						
	A05-2B38/2D38	11	A03-2B38*2D38	11	5	A03B88			01						
	A05-2B38/2D38	22	A07-2B38/2D38	22	5	A03B88			01						
	A05-2B40/2D40	11	A03-2B40*2D40	11	5	A03B90			01						
	A05-2B40/2D40	22	A07-2B40/2D40	22	5	A03B90			01						
	A05-2B41/2D41	11	A03-2B41*2D41	11	5	A03B91			01						
	A05-2B41/2D41	22	A07-2B41/2D41	22	5	A03B91			01						
	A05-2B42/2D42	11	A03-2B42*2D42	11	5	A03B92			01						
	A05-2B42/2D42	22	A07-2B42/2D42	22	5	A03B92			01						

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Wire Lists 11-25

Logic Chassis Wire List

PAGE 23 PACK			A05 60000496 REV A										DATE 90/01/19		
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A05-2B43/2D43	11	A03-2B43*2D43	11	5	A03B93			01							
A05-2B43/2D43	22	A07-2B43/2D43	22	5	A03B93			01							



PAGE	24	PACK	A06 60000496 REV A										DATE 90/01/19			
	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
	A06-1A03/1C03	11	A04-2B21/2D21	11	13	A04B71			01							
	A06-1A04/1C04	11	A04-2A10/2C10	11	13	A04A60			01							
	A06-1A05/1C05	11	A04-2A32/2C32	11	13	A04A82			01							
	A06-1A10/1C10	11	A05-2A33/2C33	11	10	A06A10			01							
	A06-1A17/1C17	11	A05-1A17/1C17	11	4	A06A17			01							
	A06-1A18/1C18	11	A05-1A18/1C18	11	4	A06A18			01							
	A06-1A19/1C19	11	A05-1A19/1C19	11	4	A06A19			01							
	A06-1A20/1C20	11	A05-1A20/1C20	11	4	A05A20			01							
	A06-1A21/1C21	11	A05-1A21/1C21	11	4	A06A21			01							
	A06-1A22/1C22	11	A05-1A22/1C22	11	4	A06A22			01							
	A06-1A24/1C24	11	A05-1A24/1C24	11	4	A06A24			01							
	A06-1A25/1C25	11	A05-1A25/1C25	11	4	A06A25			01							
	A06-1A26/1C26	11	A05-1A26/1C26	11	4	A06A26			01							
	A06-1A27/1C27	11	A05-1A27/1C27	11	4	A06A27			01							
	A06-1A28/1C28	11	A05-1A28/1C28	11	4	A06A28			01							
	A06-1A29/1C29	11	A05-1A29/1C29	11	4	A06A29			01							
	A06-1A30/1C30	11	A05-1A30/1C30	11	4	A05A30			01							
	A06-1A31/1C31	11	A05-1A31/1C31	11	4	A05A31			01							
	A06-1A32/1C32	11	A05-1A32/1C32	11	4	A05A32			01							
	A06-1A33/1C33	11	A05-1A33/1C33	11	4	A05A33			01							
	A06-1A34/1C34	11	A05-1A34/1C34	11	4	A05A34			01							
	A06-1A35/1C35	11	A05-1A35/1C35	11	4	A05A35			01							
	A06-1A36/1C36	11	A05-1A36/1C36	11	4	A05A36			01							
	A06-1A37/1C37	11	A05-1A37/1C37	11	4	A05A37			01							
	A06-1A38/1C38	11	A05-1A38/1C38	11	4	A05A38			01							
	A06-1A40/1C40	11	A05-1A40/1C40	11	4	A06A40			01							

PAGE	25	PACK	A06 60000496 REV A										DATE 90/01/19			
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A06-1A41/1C41	11	A05-1A41/1C41	11	4	A06A41			01								
A06-1A42/1C42	11	A05-1A42/1C42	11	4	A05A42			01								
A06-1A43/1C43	11	A05-1A43/1C43	11	4	A06A43			01								
A06-1B03/1D03	11	A04-2B13/2D13	11	13	A04B63			01								
A06-1B04/1D04	11	A04-1B04/1D04	11	13	A04B04			01								
A06-1B10/1D10	11	A05-1A07/1C07	11	4	A06B10			01								
A06-1B17/1D17	11	A05-1B17/1D17	11	4	A06B17			01								
A06-1B18/1D18	11	A05-1B18/1D18	11	4	A06B18			01								
A06-1B19/1D19	11	A05-1B19/1D19	11	4	A06B19			01								
A06-1B20/1D20	11	A05-1B20/1D20	11	4	A05B20			01								
A06-1B21/1D21	11	A05-1B21/1D21	11	4	A05B21			01								
A06-1B22/1D22	11	A05-1B22/1D22	11	4	A06B22			01								
A06-1B24/1D24	11	A05-1B24/1D24	11	4	A06B24			01								
A06-1B25/1D25	11	A05-1B25/1D25	11	4	A06B25			01								
A06-1B26/1D26	11	A05-1B26/1D26	11	4	A06B26			01								
A06-1B27/1D27	11	A05-1B27/1D27	11	4	A06B27			01								
A06-1B28/1D28	11	A05-1B28/1D28	11	4	A06B28			01								
A06-1B29/1D29	11	A05-1B29/1D29	11	4	A06B29			01								
A06-1B30/1D30	11	A05-1B30/1D30	11	4	A05B30			01								
A06-1B31/1D31	11	A05-1B31/1D31	11	4	A05B31			01								
A06-1B32/1D32	11	A05-1B32/1D32	11	4	A05B32			01								
A06-1B33/1D33	11	A05-1B33/1D33	11	4	A05B33			01								
A06-1B34/1D34	11	A05-1B34/1D34	11	4	A05B34			01								
A06-1B35/1D35	11	A05-1B35/1D35	11	4	A05B35			01								
A06-1B36/1D36	11	A05-1B36/1D36	11	4	A05B36			01								
A06-1B37/1D37	11	A05-1B37/1D37	11	4	A05B37			01								
A06-1B38/1D38	11	A05-1B38/1D38	11	4	A05B38			01								

PAGE	26	PACK	A06 60000496 REV A										DATE 90/01/19		
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A06-1B40/1D40	11	A05-1B40/1D40	11	4	A06B40			01							
A06-1B41/1D41	11	A05-1B41/1D41	11	4	A06B41			01							
A06-1B42/1D42	11	A05-1B42/1D42	11	4	A05B42			01							
A06-1B43/1D43	11	A05-1B43/1D43	11	4	A06B43			01							
A06-2A03/2C03	11	A05-2A03/2C03	11	4	A06A53			01							
A06-2A04/2C04	11	A05-2A04/2C04	11	4	A06A54			01							
A06-2A05/2C05	11	A05-2A05/2C05	11	4	A06A55			01							
A06-2A07/2C07	11	A05-2A07/2C07	11	4	A06A57			01							
A06-2A08/2C08	11	A05-2A08/2C08	11	4	A06A58			01							
A06-2A09/2C09	11	A05-2A09/2C09	11	4	A05A59			01							
A06-2A10/2C10	11	A05-2A10/2C10	11	4	A06A60			01							
A06-2A11/2C11	11	A05-2A11/2C11	11	4	A06A61			01							
A06-2A12/2C12	11	A05-2A12/2C12	11	4	A05A62			01							
A06-2A13/2C13	11	A14-1A17/1C17	11	10	A14A17			01							
A06-2A14/2C14	11	A14-2A14/2C14	11	7	A14A64			01							
A06-2A21/2C21	11	A05-2A21/2C21	11	4	A06A71			01							
A06-2A22/2C22	11	A05-2A22/2C22	11	4	A06A72			01							
A06-2A24/2C24	11	A05-2A24/2C24	11	4	A06A74			01							
A06-2A27/2C27	11	A05-2A27/2C27	11	4	A06A77			01							
A06-2A28/2C28	11	A05-2A28/2C28	11	4	A06A78			01							
A06-2A30/2C30	11	A14-2A30/2C30	11	7	A04A80			01							
A06-2A30/2C30	22	A04-2A30/2C30	22	5	A04A80			01							
A06-2A31/2C31	11	A14-2A31/2C31	11	7	A04A81			01							
A06-2A31/2C31	22	A04-2A31/2C31	22	5	A04A81			01							
A06-2B03/2D03	11	A05-2B03/2D03	11	4	A06B53			01							
A06-2B04/2D04	11	A05-2B04/2D04	11	4	A06B54			01							
A06-2B05/2D05	11	A05-2B05/2D05	11	4	A06B55			01							
A06-2B07/2D07	11	A05-2B07/2D07	11	4	A06B57			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A06-2B08/2D08	11	A05-2B08/2D08	11	4	A06B58			01				
A06-2B09/2D09	11	A05-2B09/2D09	11	4	A05B59			01				
A06-2B10/2D10	11	A05-2B10/2D10	11	4	A06B60			01				
A06-2B11/2D11	11	A05-2B11/2D11	11	4	A06B61			01				
A06-2B12/2D12	11	A05-2B12/2D12	11	4	A05B62			01				
A06-2B13/2D13	11	A14-1B17/1D17	11	10	A06B63			01				
A06-2B14/2D14	11	A04-2A17/2C17	11	5	A06B64			01				
A06-2B21/2D21	11	A05-2B21/2D21	11	4	A06B71			01				
A06-2B22/2D22	11	A05-2B22/2D22	11	4	A06B72			01				
A06-2B24/2D24	11	A05-2B24/2D24	11	4	A05B74			01				
A06-2B27/2D27	11	A05-2B27/2D27	11	4	A06B77			01				
A06-2B28/2D28	11	A05-2B28/2D28	11	4	A05B78			01				
A06-2B30/2D30	11	A14-2B30/2D30	11	7	A04B80			01				
A06-2B30/2D30	22	A04-2B30/2D30	22	5	A04B80			01				
A06-2B31/2D31	11	A09-2B31/2D31	11	5	A04B81			01				
A06-2B31/2D31	22	A04-2B31/2D31	22	5	A04B81			01				
A06-2B32/2D32	11	A04-2B32*2D32	11	5	A04B82			01				
A06-2B32/2D32	22	A14-2B32/2D32	22	7	A04B82			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A07-1A03/1C03	11	A08-2A31/2C31	11	11	A08A81			01						
A07-1A05/1C05	11	A08-2B32/2D32	11	11	A08B82			01						
A07-1A07/1C07	11	A04-1B37/1D37	11	13	A04A07			01						
A07-1A08/1C08	11	A05-1A08/1C08	11	5	A04A08			01						
A07-1A08/1C08	22	A11-1A08/1C08	22	6	A04A08			01						
A07-1A09/1C09	11	A05-1A09/1C09	11	5	A04A09			01						
A07-1A09/1C09	22	A11-1A09/1C09	22	6	A04A09			01						
A07-1A10/1C10	11	A05-1A10/1C10	11	5	A04A10			01						
A07-1A10/1C10	22	A11-1A10/1C10	22	6	A04A10			01						
A07-1A11/1C11	11	A05-1A11/1C11	11	5	A04A11			01						
A07-1A11/1C11	22	A11-1A11/1C11	22	6	A04A11			01						
A07-1A12/1C12	11	A05-1A12/1C12	11	5	A04A12			01						
A07-1A12/1C12	22	A12-1A12/1C08	22	6	A04A12			01						
A07-1A13/1C13	11	A05-1A13/1C13	11	5	A04A13			01						
A07-1A13/1C13	22	A12-1A09/1C09	22	6	A04A13			01						
A07-1A14/1C14	11	A05-1A14/1C14	11	5	A04A14			01						
A07-1A14/1C14	22	A12-1A10/1C10	22	6	A04A14			01						
A07-1A15/1C15	11	A05-1A15/1C15	11	5	A04A15			01						
A07-1A15/1C15	22	A12-1A11/1C11	22	6	A04A15			01						
A07-1A16/1C16	11	A05-1A16/1C16	11	5	A04A16			01						
A07-1A16/1C16	22	A11-1A16/1C16	22	6	A04A16			01						
A07-1A17/1C17	11	A08-2A28/2C28	11	9	A08A78			01						
A07-1A18/1C18	11	A08-2A27/2C27	11	9	A08A77			01						
A07-1A19/1C19	11	A08-2A30/2C30	11	9	A08A80			01						
A07-1A20/1C20	11	A08-2B30/2D30	11	9	A08B80			01						
A07-1A22/1C22	11	A13-1A09/1C09	11	6	A07A22			01						
A07-1A24/1C24	11	A13-1A28/1C28	11	6	A07A24			01						
A07-1A25/1C25	11	A13-1A29/1C29	11	6	A07A25			01						
A07-1A26/1C26	11	A13-1A31/1C31	11	6	A07A26			01						
A07-1A27/1C27	11	A13-1A32/1C32	11	6	A07A27			01						
A07-1A28/1C28	11	A13-1A33/1C33	11	6	A07A28			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A07-1A29/1C29	11	A08-2B25/2D25	11	8	A08B75			01								
A07-1A30/1C30	11	A08-2B26/2D26	11	8	A08B76			01								
A07-1A31/1C31	11	A08-2B27/2D27	11	8	A08B77			01								
A07-1A34/1C34	11	A04-1B40/1D40	11	5	A07A34			01								
A07-1A37/1C37	11	A09-2A26/2C26	11	7	A09A76			01								
A07-1A38/1C38	11	A04-2A22/2C22	11	7	A07A38			01								
A07-1A40/1C40	11	A10-2B25/2D25	11	7	A07A40			01								
A07-1B03/1D03	11	A04-2B14/2D14	11	13	A04B64			01								
A07-1B04/1D04	11	A08-2B31/2D31	11	11	A08B61			01								
A07-1B05/1D05	11	A04-1B05/1D05	11	13	A04B05			01								
A07-1B07/1D07	11	A08-2B33/2D33	11	11	A08B63			01								
A07-1B08/1D08	11	A05-1B08/1D08	11	5	A04B08			01								
A07-1B08/1D08	22	A11-1B08/1D08	22	6	A04B08			01								
A07-1B09/1D09	11	A05-1B09/1D09	11	5	A04B09			01								
A07-1B09/1D09	22	A11-1B09/1D09	22	6	A04B09			01								
A07-1B10/1D10	11	A05-1B10/1D10	11	5	A04B10			01								
A07-1B10/1D10	22	A11-1B10/1D10	22	6	A04B10			01								
A07-1B11/1D11	11	A05-1B11/1D11	11	5	A04B11			01								
A07-1B11/1D11	22	A11-1B11/1D11	22	6	A04B11			01								
A07-1B12/1D12	11	A05-1B12/1D12	11	5	A04B12			01								
A07-1B12/1D12	22	A12-1B08/1D08	22	6	A04B12			01								
A07-1B13/1D13	11	A05-1B13/1D13	11	5	A04B13			01								
A07-1B13/1D13	22	A12-1B09/1D09	22	6	A04B13			01								
A07-1B14/1D14	11	A05-1B14/1D14	11	5	A04B14			01								
A07-1B14/1D14	22	A12-1B10/1D10	22	6	A04B14			01								
A07-1B15/1D15	11	A05-1B15/1D15	11	5	A04B15			01								
A07-1B15/1D15	22	A12-1B11/1D11	22	6	A04B15			01								
A07-1B16/1D16	11	A05-1B16/1D16	11	5	A04B16			01								
A07-1B16/1D16	22	A12-1A16/1C16	22	6	A04B16			01								
A07-1B17/1D17	11	A08-2B28/2D28	11	9	A08B78			01								
A07-1B18/1D18	11	A08-2B29/2D29	11	9	A08B79			01								

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	A07-1B19/1D19	11	A08-2A29/2C29	11	9	A08A79			01						
	A07-1B20/1D20	11	A08-1A43/1C43	11	6	A08A43			01						
	A07-1B21/1D21	11	A10-1B24/1D24	11	5	A12A88			01						
	A07-1B22/1D22	11	A09-2A34/2C34	11	9	A12A13			01						
	A07-1B24/1D24	11	A10-1B21/1D21	11	5	A07B24			01						
	A07-1B25/1D25	11	A10-1B22/1D22	11	5	A07B25			01						
	A07-1B26/1D26	11	A13-1A16/1C16	11	6	A07B26			01						
	A07-1B27/1D27	11	A13-1A17/1C17	11	6	A07B27			01						
	A07-1B28/1D28	11	A13-1A18/1C18	11	6	A07B28			01						
	A07-1B29/1D29	11	A08-2A26/2C26	11	8	A08A76			01						
	A07-1B30/1D30	11	A13-1A34/1C34	11	6	A07B30			01						
	A07-1B31/1D31	11	A03-2B25/2D25	11	8	A03B75			01						
	A07-1B33/1D33	11	A10-2B34/2D34	11	8	A07B33			01						
	A07-1B37/1D37	11	A14-2A11/2C11	11	7	A07B37			01						
	A07-1B38/1D38	11	A11-1B12/1D12	11	6	A07B38			01						
	A07-2A15/2C15	11	A08-1A32/1C32	11	6	A08A32			01						
	A07-2A34/2C34	11	A05-2A34/2C34	11	5	A04A84			01						
	A07-2A34/2C34	22	A08-2A34/2C34	22	4	A04A84			01						
	A07-2A35/2C35	11	A08-2A35/2C35	11	4	A03A85			01						
	A07-2A35/2C35	22	A05-2A35/2C35	22	5	A03A85			01						
	A07-2A36/2C36	11	A08-2A36/2C36	11	4	A03A86			01						
	A07-2A36/2C36	22	A05-2A36/2C36	22	5	A03A86			01						
	A07-2A37/2C37	11	A08-2A37/2C37	11	4	A03A87			01						
	A07-2A37/2C37	22	A05-2A37/2C37	22	5	A03A87			01						
	A07-2A38/2C38	11	A08-2A38/2C38	11	4	A03A88			01						
	A07-2A38/2C38	22	A05-2A38/2C38	22	5	A03A88			01						
	A07-2A40/2C40	11	A08-2A40/2C40	11	4	A03A90			01						
	A07-2A40/2C40	22	A05-2A40/2C40	22	5	A03A90			01						
	A07-2A41/2C41	11	A08-2A41/2C41	11	4	A03A91			01						
	A07-2A41/2C41	22	A05-2A41/2C41	22	5	A03A91			01						
	A07-2A42/2C42	11	A08-2A42/2C42	11	4	A03A92			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A07-2A42/2C42	22	A05-2A42/2C42	22	5	A03A92			01				
A07-2A43/2C43	11	A08-2A43/2C43	11	4	A03A93			01				
A07-2A43/2C43	22	A05-2A43/2C43	22	5	A03A93			01				
A07-2B05/2D05	11	A07-2B05/2D05	11	3	A07B05			01				
A07-2B05/2D05	11	A07-2B05/2D05	11	3	A07B05			01				
A07-2B15/2D15	11	A08-2B15/2D15	11	4	A08B65			01				
A07-2B33/2D33	11	A05-2B33/2D33	11	5	A04B83			01				
A07-2B33/2D33	22	A11-2B33/2D33	22	6	A04B83			01				
A07-2B34/2D34	11	A05-2B34/2D34	11	5	A04B84			01				
A07-2B34/2D34	22	A11-2B34/2D34	22	6	A04B84			01				
A07-2B35/2D35	11	A08-2B35/2D35	11	4	A03B85			01				
A07-2B35/2D35	22	A05-2B35/2D35	22	5	A03B85			01				
A07-2B36/2D36	11	A08-2B36/2D36	11	4	A03B86			01				
A07-2B36/2D36	22	A05-2B36/2D36	22	5	A03B86			01				
A07-2B37/2D37	11	A08-2B37/2D37	11	4	A03B87			01				
A07-2B37/2D37	22	A05-2B37/2D37	22	5	A03B87			01				
A07-2B38/2D38	11	A08-2B38/2D38	11	4	A03B88			01				
A07-2B38/2D38	22	A05-2B38/2D38	22	5	A03B88			01				
A07-2B40/2D40	11	A08-2B40/2D40	11	4	A03B90			01				
A07-2B40/2D40	22	A05-2B40/2D40	22	5	A03B90			01				
A07-2B41/2D41	11	A08-2B41/2D41	11	4	A03B91			01				
A07-2B41/2D41	22	A05-2B41/2D41	22	5	A03B91			01				
A07-2B42/2D42	11	A08-2B42/2D42	11	4	A03B92			01				
A07-2B42/2D42	22	A05-2B42/2D42	22	5	A03B92			01				
A07-2B43/2D43	11	A08-2B43/2D43	11	4	A03B93			01				
A07-2B43/2D43	22	A05-2B43/2D43	22	5	A03B93			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A08-1B03/1D03	11	A04-2A16/2C16	11	13	A04A66			01							
A08-1B04/1D04	11	A10-1B35/1D35	11	6	A10B35			01							
A08-1B05/1D05	11	A04-2A29/2C29	11	13	A04A79			01							
A08-1B05/1D05	22	A11-1B05/1D05	22	4	A04A79			01							
A08-1B07/1D07	11	A09-2B25/2D25	11	10	A09B75			01							
A08-1B08/1D08	11	A10-2A07/2C07	11	8	A08B08			01							
A08-1B17/1D17	11	A11-1A42/1C42	11	6	A08B17			01							
A08-1B21/1D21	11	A10-1A42/1C42	11	6	A10A42			01							
A08-1B24/1D24	11	A09-1B24/1D24	11	4	A09B24			01							
A08-1B25/1D25	11	A09-1B25/1D25	11	4	A09B25			01							
A08-1B26/1D26	11	A09-1B26/1D26	11	4	A09B26			01							
A08-1B27/1D27	11	A09-1B27/1D27	11	4	A09B27			01							
A08-1B28/1D28	11	A09-1B28/1D28	11	4	A09B28			01							
A08-1B29/1D29	11	A09-1B29/1D29	11	4	A09B29			01							
A08-1B30/1D30	11	A09-1B30/1D30	11	4	A09B30			01							
A08-1B31/1D31	11	A09-1B31/1D31	11	4	A09B31			01							
A08-1B33/1D33	11	A11-1A13/1C13	11	6	A11A13			01							
A08-1B34/1D34	11	A13-1B33/1D33	11	6	A08B34			01							
A08-1B35/1D35	11	A04-2B08/2D08	11	6	A08B35			01							
A08-1B36/1D36	11	A09-1B41/1D41	11	4	A09B41			01							
A08-1B36/1D36	22	A11-2A17/2C17	22	7	A09B41			01							
A08-1B37/1D37	11	A02-2B19/2D19	11	8	A08B37			01							
A08-1B38/1D38	22	A05-2B20/2D20	22	7	A08B38			01							
A08-1B40/1D40	11	A10-2A41/2C41	11	8	A08B40			01							
A08-1B41/1D41	11	A09-1A38/1C38	11	4	A09A38			01							
A08-1B42/1D42	11	A09-2B05/2D05	11	5	A09B55			01							
A08-1B43/1D43	11	A09-1A34/1C34	11	4	A09A34			01							
A08-2A03/2C03	11	A13-2A41/2C41	11	7	A08A53			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A08-2A04/2C04	11	A13-2B33/2D33	11	7	A08A54			01				
A08-2A05/2C05	11	A10-2A25/2C25	11	6	A08A55			01				
A08-2A07/2C07	11	A09-2A07/2C07	11	4	A09A57			01				
A08-2A08/2C08	11	A09-2A08/2C08	11	4	A09A58			01				
A08-2A09/2C09	11	A09-2A09/2C09	11	4	A09A59			01				
A08-2A10/2C10	11	A09-2A10/2C10	11	4	A09A60			01				
A08-2A11/2C11	11	A09-2A11/2C11	11	4	A09A61			01				
A08-2A12/2C12	11	A09-2A12/2C12	11	4	A09A62			01				
A08-2A13/2C13	11	A09-2A13/2C13	11	4	A09A63			01				
A08-2A14/2C14	11	A09-2A14/2C14	11	4	A09A64			01				
A08-2A16/2C16	11	A10-1A22/1C22	11	8	A10A22			01				
A08-2A17/2C17	11	A02-1B36/1D36	11	8	A02B36			01				
A08-2A26/2C26	11	A07-1B29/1D29	11	8	A08A76			01				
A08-2A27/2C27	11	A07-1A18/1C18	11	9	A08A77			01				
A08-2A28/2C28	11	A07-1A17/1C17	11	9	A08A78			01				
A08-2A29/2C29	11	A07-1B19/1D19	11	9	A08A79			01				
A08-2A30/2C30	11	A07-1A19/1C19	11	9	A08A80			01				
A08-2A31/2C31	11	A07-1A03/1C03	11	11	A08A81			01				
A08-2A32/2C32	11	A02-1A20/1C20	11	10	A08A82			01				
A08-2A33/2C33	11	A10-2B41/2D41	11	5	A08A83			01				
A08-2A34/2C34	11	A11-2A34/2C34	11	5	A04A84			01				
A08-2A34/2C34	22	A07-2A34/2C34	22	4	A04A84			01				
A08-2A35/2C35	11	A07-2A35/2C35	11	4	A03A85			01				
A08-2A35/2C35	22	A09-2A35/2C35	22	4	A03A85			01				
A08-2A36/2C36	11	A07-2A36/2C36	11	4	A03A86			01				
A08-2A36/2C36	22	A09-2A36/2C36	22	4	A03A86			01				
A08-2A37/2C37	11	A07-2A37/2C37	11	4	A03A87			01				
A08-2A37/2C37	22	A09-2A37/2C37	22	4	A03A87			01				
A08-2A38/2C38	11	A07-2A38/2C38	11	4	A03A88			01				
A08-2A38/2C38	22	A09-2A38/2C38	22	4	A03A88			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A08-2A40/2C40	11	A07-2A40/2C40	11	4	A03A90			01				
A08-2A40/2C40	22	A09-2A40/2C40	22	4	A03A90			01				
A08-2A41/2C41	11	A07-2A41/2C41	11	4	A03A91			01				
A08-2A41/2C41	22	A09-2A41/2C41	22	4	A03A91			01				
A08-2A42/2C42	11	A07-2A42/2C42	11	4	A03A92			01				
A08-2A42/2C42	22	A09-2A42/2C42	22	4	A03A92			01				
A08-2A43/2C43	11	A07-2A43/2C43	11	4	A03A93			01				
A08-2A43/2C43	22	A09-2A43/2C43	22	4	A03A93			01				
A08-2B03/2D03	11	A13-2B43/2D43	11	7	A08B53			01				
A08-2B04/2D04	22	A04-2B15/2D15	22	6	A08B54			01				
A08-2B07/2D07	11	A09-2B07/2D07	11	4	A09B57			01				
A08-2B08/2D08	11	A09-2B08/2D08	11	4	A09B58			01				
A08-2B09/2D09	11	A09-2B09/2D09	11	4	A09B59			01				
A08-2B10/2D10	11	A09-2B10/2D10	11	4	A09B60			01				
A08-2B11/2D11	11	A09-2B11/2D11	11	4	A09B61			01				
A08-2B12/2D12	11	A09-2B12/2D12	11	4	A09B62			01				
A08-2B13/2D13	11	A09-2B13/2D13	11	4	A09B63			01				
A08-2B14/2D14	11	A09-2B14/2D14	11	4	A09B64			01				
A08-2B15/2D15	11	A07-2B15/2D15	11	4	A08B65			01				
A08-2B16/2D16	11	A04-2A09/2C09	11	6	A03B84			01				
A08-2B25/2D25	11	A07-1A29/1C29	11	8	A08B75			01				
A08-2B26/2D26	11	A07-1A30/1C30	11	8	A08B76			01				
A08-2B27/2D27	11	A07-1A31/1C31	11	8	A08B77			01				
A08-2B28/2D28	11	A07-1B17/1D17	11	9	A08B78			01				
A08-2B29/2D29	11	A07-1B18/1D18	11	9	A08B79			01				
A08-2B30/2D30	11	A07-1A20/1C20	11	9	A08B80			01				
A08-2B31/2D31	11	A07-1B04/1D04	11	11	A08B81			01				
A08-2B32/2D32	11	A07-1A05/1C05	11	11	A08B82			01				
A08-2B33/2D33	11	A07-1B07/1D07	11	11	A08B83			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A08-2B34/2D34	11	A11-1A12/1C12	11	10	A08B84			01				
A08-2B35/2D35	11	A07-2B35/2D35	11	4	A03B85			01				
A08-2B35/2D35	22	A09-2B35/2D35	22	4	A03B85			01				
A08-2B36/2D36	11	A07-2B36/2D36	11	4	A03B86			01				
A08-2B36/2D36	22	A09-2B36/2D36	22	4	A03B86			01				
A08-2B37/2D37	11	A07-2B37/2D37	11	4	A03B87			01				
A08-2B37/2D37	22	A09-2B37/2D37	22	4	A03B87			01				
A08-2B38/2D38	11	A07-2B38/2D38	11	4	A03B88			01				
A08-2B38/2D38	22	A09-2B38/2D38	22	4	A03B88			01				
A08-2B40/2D40	11	A07-2B40/2D40	11	4	A03B90			01				
A08-2B40/2D40	22	A09-2B40/2D40	22	4	A03B90			01				
A08-2B41/2D41	11	A07-2B41/2D41	11	4	A03B91			01				
A08-2B41/2D41	22	A09-2B41/2D41	22	4	A03B91			01				
A08-2B42/2D42	11	A07-2B42/2D42	11	4	A03B92			01				
A08-2B42/2D42	22	A09-2B42/2D42	22	4	A03B92			01				
A08-2B43/2D43	11	A07-2B43/2D43	11	4	A03B93			01				
A08-2B43/2D43	22	A09-2B43/2D43	22	4	A03B93			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A09-1A12/1C12	11	A11-1B18/1D18	11	5	A11B18			01						
A09-1A13/1C13	11	A09-1B34/1D34	11	6	A09B34			01						
A09-1A24/1C24	11	A08-1A24/1C24	11	4	A09A24			01						
A09-1A24/1C24	22	A11-1A24/1C24	22	5	A09A24			01						
A09-1A25/1C25	11	A08-1A25/1C25	11	4	A09A25			01						
A09-1A25/1C25	22	A11-1A25/1C25	22	5	A09A25			01						
A09-1A26/1C26	11	A08-1A26/1C26	11	4	A09A26			01						
A09-1A26/1C26	22	A11-1A26/1C26	22	5	A09A26			01						
A09-1A27/1C27	11	A08-1A27/1C27	11	4	A09A27			01						
A09-1A27/1C27	22	A11-1A27/1C27	22	5	A09A27			01						
A09-1A28/1C28	11	A08-1A28/1C28	11	4	A09A28			01						
A09-1A28/1C28	22	A12-1A24/1C24	22	5	A09A28			01						
A09-1A29/1C29	11	A08-1A29/1C29	11	4	A09A29			01						
A09-1A29/1C29	22	A12-1A25/1C25	22	5	A09A29			01						
A09-1A30/1C30	11	A08-1A30/1C30	11	4	A09A30			01						
A09-1A30/1C30	22	A12-1A26/1C26	22	5	A09A30			01						
A09-1A31/1C31	11	A08-1A31/1C31	11	4	A09A31			01						
A09-1A31/1C31	22	A12-1A27/1C27	22	5	A09A31			01						
A09-1A32/1C32	11	A11-1A07/1C07	11	6	A11A07			01						
A09-1A34/1C34	11	A08-1B43/1D43	11	4	A09A34			01						
A09-1A35/1C35	11	A13-1A22/1C22	11	6	A09A35			01						
A09-1A38/1C38	11	A08-1B41/1D41	11	4	A09A38			01						
A09-1A40/1C40	11	A11-1B41/1D41	11	5	A09A40			01						
A09-1A41/1C41	11	A08-1A36/1C36	11	4	A09A41			01						
A09-1A42/1C42	11	A08-1A37/1C37	11	4	A09A42			01						
A09-1A43/1C43	11	A10-2B40/2D40	11	8	A09A43			01						
A09-1B03/1D03	11	A09-2B27/2D27	11	10	A09B77			01						
A09-1B24/1D24	11	A08-1B24/1D24	11	4	A09B24			01						
A09-1B24/1D24	22	A11-1B24/1D24	22	5	A09B24			01						
A09-1B25/1D25	11	A08-1B25/1D25	11	4	A09B25			01						
A09-1B25/1D25	22	A11-1B25/1D25	22	5	A09B25			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A09-1B26/1D26	11	A08-1B26/1D26	11	4	A09B26			01							
A09-1B26/1D26	22	A11-1B26/1D26	22	5	A09B26			01							
A09-1B27/1D27	11	A08-1B27/1D27	11	4	A09B27			01							
A09-1B27/1D27	22	A11-1B27/1D27	22	5	A09B27			01							
A09-1B28/1D28	11	A08-1B28/1D28	11	4	A09B28			01							
A09-1B28/1D28	22	A12-1B24/1D24	22	5	A09B28			01							
A09-1B29/1D29	11	A08-1B29/1D29	11	4	A09B29			01							
A09-1B29/1D29	22	A12-1B25/1D25	22	5	A09B29			01							
A09-1B30/1D30	11	A08-1B30/1D30	11	4	A09B30			01							
A09-1B30/1D30	22	A12-1B26/1D26	22	5	A09B30			01							
A09-1B31/1D31	11	A08-1B31/1D31	11	4	A09B31			01							
A09-1B31/1D31	22	A12-1B27/1D27	22	5	A09B31			01							
A09-1B33/1D33	11	A08-1A21/1C21	11	5	A09B33			01							
A09-1B34/1D34	11	A09-1A13/1C13	11	6	A09B34			01							
A09-1B35/1D35	11	A11-1A35/1C35	11	4	A09B35			01							
A09-1B37/1D37	11	A08-1A33/1C33	11	4	A09B37			01							
A09-1B38/1D38	11	A12-1B41/1D41	11	5	A09B38			01							
A09-1B41/1D41	11	A08-1B36/1D36	11	4	A09B41			01							
A09-1B42/1D42	11	A08-1A42/1C42	11	4	A09B42			01							
A09-1B42/1D42	22	A10-2A40/2C40	22	8	A09B42			01							
A09-2A03/2C03	11	A11-1A21/1C21	11	6	A11A21			01							
A09-2A05/2C05	11	A10-2B08/2D08	11	4	A09A55			01							
A09-2A07/2C07	11	A08-2A07/2C07	11	4	A09A57			01							
A09-2A07/2C07	22	A11-2A07/2C07	22	5	A09A57			01							
A09-2A08/2C08	11	A08-2A08/2C08	11	4	A09A58			01							
A09-2A08/2C08	22	A11-2A08/2C08	22	5	A09A58			01							
A09-2A09/2C09	11	A08-2A09/2C09	11	4	A09A59			01							
A09-2A09/2C09	22	A11-2A09/2C09	22	5	A09A59			01							
A09-2A10/2C10	11	A08-2A10/2C10	11	4	A09A60			01							
A09-2A10/2C10	22	A11-2A10/2C10	22	5	A09A60			01							
A09-2A11/2C11	11	A08-2A11/2C11	11	4	A09A61			01							
A09-2A11/2C11	22	A12-2A07/2C07	22	5	A09A61			01							
A09-2A12/2C12	11	A08-2A12/2C12	11	4	A09A62			01							
A09-2A12/2C12	22	A12-2A08/2C08	22	5	A09A62			01							

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	A09-2A13/2C13	11	A08-2A13/2C13	11	4	A09A63			01						
	A09-2A13/2C13	22	A12-2A09/2C09	22	5	A09A63			01						
	A09-2A14/2C14	11	A08-2A14/2C14	11	4	A09A64			01						
	A09-2A14/2C14	22	A12-2A10/2C10	22	5	A09A64			01						
	A09-2A17/2C17	11	A11-2A13/2C13	11	5	A11A63			01						
	A09-2A20/2C20	11	A11-2B03/2D03	11	6	A09A70			01						
	A09-2A21/2C21	11	A11-2B13/2D13	11	5	A09A71			01						
	A09-2A22/2C22	11	A11-2B15/2D15	11	5	A09A72			01						
	A09-2A24/2C24	11	A13-2A43/2C43	11	6	A09A74			01						
	A09-2A25/2C25	11	A13-2B20/2D20	11	6	A09A75			01						
	A09-2A26/2C26	11	A07-1A37/1C37	11	7	A09A76			01						
	A09-2A27/2C27	11	A11-2B36/2D36	11	5	A09A77			01						
	A09-2A33/2C33	11	A13-1A21/1C21	11	10	A09A83			01						
	A09-2A34/2C34	11	A07-1B22/1D22	11	9	A12A13			01						
	A09-2A34/2C34	22	A10-2A03/2C03	22	6	A12A13			01						
	A09-2A35/2C35	11	A14-2A35/2C35	11	6	A03A85			01						
	A09-2A35/2C35	22	A08-2A35/2C35	22	4	A03A85			01						
	A09-2A36/2C36	11	A14-2A36/2C36	11	6	A03A86			01						
	A09-2A36/2C36	22	A08-2A36/2C36	22	4	A03A86			01						
	A09-2A37/2C37	11	A14-2A37/2C37	11	6	A03A87			01						
	A09-2A37/2C37	22	A08-2A37/2C37	22	4	A03A87			01						
	A09-2A38/2C38	11	A14-2A38/2C38	11	6	A03A88			01						
	A09-2A38/2C38	22	A08-2A38/2C38	22	4	A03A88			01						
	A09-2A40/2C40	11	A14-2A40/2C40	11	6	A03A90			01						
	A09-2A40/2C40	22	A08-2A40/2C40	22	4	A03A90			01						
	A09-2A41/2C41	11	A14-2A41/2C41	11	6	A03A91			01						
	A09-2A41/2C41	22	A08-2A41/2C41	22	4	A03A91			01						
	A09-2A42/2C42	11	A14-2A42/2C42	11	6	A03A92			01						
	A09-2A42/2C42	22	A08-2A42/2C42	22	4	A03A92			01						
	A09-2A43/2C43	11	A14-2A43/2C43	11	6	A03A93			01						
	A09-2A43/2C43	22	A08-2A43/2C43	22	4	A03A93			01						
	A09-2B05/2D05	11	A08-1B42/1D42	11	5	A09B55			01						
	A09-2B05/2D05	22	A11-1A41/1C41	22	6	A09B55			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A09-2B07/2D07	11	A08-2B07/2D07	11	4	A09B57			01				
A09-2B07/2D07	22	A11-2B07/2D07	22	5	A09B57			01				
A09-2B08/2D08	11	A08-2B08/2D08	11	4	A09B58			01				
A09-2B08/2D08	22	A11-2B08/2D08	22	5	A09B58			01				
A09-2B09/2D09	11	A08-2B09/2D09	11	4	A09B59			01				
A09-2B09/2D09	22	A11-2B09/2D09	22	5	A09B59			01				
A09-2B10/2D10	11	A08-2B10/2D10	11	4	A09B60			01				
A09-2B10/2D10	22	A11-2B10/2D10	22	5	A09B60			01				
A09-2B11/2D11	11	A08-2B11/2D11	11	4	A09B61			01				
A09-2B11/2D11	22	A12-2B07/2D07	22	5	A09B61			01				
A09-2B12/2D12	11	A08-2B12/2D12	11	4	A09B62			01				
A09-2B12/2D12	22	A12-2B08/2D08	22	5	A09B62			01				
A09-2B13/2D13	11	A08-2B13/2D13	11	4	A09B63			01				
A09-2B13/2D13	22	A12-2B09/2D09	22	5	A09B63			01				
A09-2B14/2D14	11	A08-2B14/2D14	11	4	A09B64			01				
A09-2B14/2D14	22	A12-2B10/2D10	22	5	A09B64			01				
A09-2B19/2D19	11	A02-2A21/2C21	11	7	A09B69			01				
A09-2B19/2D19	22	A04-1A22/1C22	22	9	A09B69			01				
A09-2B20/2D20	11	A11-1B42/1D42	11	6	A09B70			01				
A09-2B21/2D21	11	A13-2B11/2D11	11	6	A09B71			01				
A09-2B22/2D22	11	A10-1A41/1C41	11	6	A09B72			01				
A09-2B24/2D24	11	A13-2B17/2D17	11	6	A09B74			01				
A09-2B25/2D25	11	A08-1B07/1D07	11	10	A09B75			01				
A09-2B26/2D26	11	A13-2B35/2D35	11	6	A09B76			01				
A09-2B27/2D27	11	A09-1B03/1D03	11	10	A09B77			01				
A09-2B31/2D31	11	A06-2B31/2D31	11	5	A04B81			01				
A09-2B31/2D31	22	A11-2B31/2D31	22	5	A04B81			01				
A09-2B33/2D33	11	A13-1B22/1D22	11	10	A09B83			01				
A09-2B34/2D34	11	A13-2B36/2D36	11	6	A09B84			01				
A09-2B35/2D35	11	A14-2B35/2D35	11	6	A03B85			01				
A09-2B35/2D35	22	A08-2B35/2D35	22	4	A03B85			01				
A09-2B36/2D36	11	A14-2B36/2D36	11	6	A03B86			01				
A09-2B36/2D36	22	A08-2B36/2D36	22	4	A03B86			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A09-2B37/2D37	11	A14-2B37/2D37	11	6	A03B87			01				
A09-2B37/2D37	22	A08-2B37/2D37	22	4	A03B87			01				
A09-2B38/2D38	11	A14-2B38/2D38	11	6	A03B88			01				
A09-2B38/2D38	22	A08-2B38/2D38	22	4	A03B88			01				
A09-2B40/2D40	11	A14-2B40/2D40	11	6	A03B90			01				
A09-2B40/2D40	22	A08-2B40/2D40	22	4	A03B90			01				
A09-2B41/2D41	11	A14-2B41/2D41	11	6	A03B91			01				
A09-2B41/2D41	22	A08-2B41/2D41	22	4	A03B91			01				
A09-2B42/2D42	11	A14-2B42/2D42	11	6	A03B92			01				
A09-2B42/2D42	22	A08-2B42/2D42	22	4	A03B92			01				
A09-2B43/2D43	11	A14-2B43/2D43	11	6	A03B93			01				
A09-2B43/2D43	22	A08-2B43/2D43	22	4	A03B93			01				

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	A10-1A07/1C07	11	A04-1A07/1C07	11	13	A04A07			01						
	A10-1A08/1C08	11	A01-1A08/1C08	11	8	A10A08			01						
	A10-1A09/1C09	11	A03-2A26/2C26	11	11	A03A76			01						
	A10-1A10/1C10	11	A01-1A10/1C10	11	8	A10A10			01						
	A10-1A11/1C11	11	A01-2B14/2D14	11	10	A10A11			01						
	A10-1A12/1C12	11	A01-1A09/1C09	11	8	A10A12			01						
	A10-1A21/1C21	11	A11-1A31/1C31	11	5	A11A31			01						
	A10-1A22/1C22	11	A08-2A16/2C16	11	8	A10A22			01						
	A10-1A27/1C27	11	A08-1A05/1C05	11	6	A08A05			01						
	A10-1A32/1C32	11	A13-1A30/1C30	11	5	A10A32			01						
	A10-1A33/1C33	11	A11-1A43/1C43	11	5	A11A43			01						
	A10-1A36/1C36	11	A11-1B43/1D43	11	5	A11B43			01						
	A10-1A40/1C40	22	A11-2A18/2C18	22	6	A08A38			01						
	A10-1A41/1C41	11	A09-2B22/2D22	11	6	A09B72			01						
	A10-1A42/1C42	11	A08-1B21/1D21	11	6	A10A42			01						
	A10-1A42/1C42	22	A11-1A22/1C22	22	6	A10A42			01						
	A10-1B05/1D05	11	A04-1A37/1C37	11	13	A04A37			01						
	A10-1B18/1D18	11	A11-2B43/2D43	11	11	A11B93			01						
	A10-1B21/1D21	11	A07-1B24/1D24	11	5	A07B24			01						
	A10-1B22/1D22	11	A07-1B25/1D25	11	5	A07B25			01						
	A10-1B24/1D24	11	A07-1B21/1D21	11	5	A12A88			01						
	A10-1B24/1D24	22	A12-2A38/2C38	22	10	A12A88			01						
	A10-1B25/1D25	11	A13-2B31/2D31	11	9	A10B25			01						
	A10-1B26/1D26	11	A12-2A31/2C31	11	9	A10B26			01						
	A10-1B32/1D32	11	A11-2A15/2C15	11	6	A11A65			01						
	A10-1B35/1D35	11	A08-1B04/1D04	11	6	A10B35			01						
	A10-1B36/1D36	11	A11-1B38/1D38	11	4	A11B38			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A10-1B40/1D40	11	A11-1A28/1C28	11	5	A11A83			01							
A10-1B43/1D43	11	A11-2B14/2D14	11	6	A10B43			01							
A10-2A03/2C03	11	A12-1A13/1C13	11	7	A12A13			01							
A10-2A03/2C03	22	A09-2A34/2C34	22	6	A12A13			01							
A10-2A04/2C04	11	A13-1A12/1C12	11	8	A10A54			01							
A10-2A05/2C05	11	A11-2B42/2D42	11	6	A11B92			01							
A10-2A07/2C07	11	A08-1B08/1D08	11	8	A08B08			01							
A10-2A07/2C07	22	A11-2B35/2D35	22	5	A08B08			01							
A10-2A08/2C08	11	A13-1B13/1D13	11	8	A13B13			01							
A10-2A09/2C09	11	A11-2A30/2C30	11	6	A11A80			01							
A10-2A10/2C10	11	A12-1B26/1D26	11	7	A09B30			01							
A10-2A11/2C11	11	A11-1A38/1C38	11	6	A11A38			01							
A10-2A12/2C12	11	A11-1A40/1C40	11	6	A10A62			01							
A10-2A13/2C13	11	A11-1A30/1C30	11	6	A11A30			01							
A10-2A14/2C14	11	A12-1B25/1D25	11	7	A09B29			01							
A10-2A15/2C15	11	A12-1B24/1D24	11	7	A09B28			01							
A10-2A16/2C16	11	A12-1B28/1D28	11	7	A12B28			01							
A10-2A17/2C17	11	A11-2B37/2D37	11	6	A11B87			01							
A10-2A18/2C18	11	A11-2A37/2C37	11	5	A11A87			01							
A10-2A19/2C19	11	A11-1A32/1C32	11	7	A11A32			01							
A10-2A22/2C22	11	A08-1A22/1C22	11	8	A11A64			01							
A10-2A22/2C22	22	A11-2A14/2C14	22	4	A11A64			01							
A10-2A25/2C25	11	A08-2A05/2C05	11	6	A08A55			01							
A10-2A25/2C25	22	A11-1B40/1D40	22	7	A08A55			01							
A10-2A26/2C26	22	A13-1B27/1D27	22	8	A09B27			01							
A10-2A27/2C27	22	A13-1B26/1D26	22	9	A09B26			01							
A10-2A28/2C28	11	A11-1B28/1D28	11	8	A11B28			01							
A10-2A29/2C29	11	A11-1A37/1C37	11	7	A11A37			01							
A10-2A30/2C30	11	A13-2A17/2C17	11	6	A13A67			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A10-2A31/2C31	22	A13-1B24/1D24	22	9	A09B24			01								
A10-2A32/2C32	22	A13-1A24/1C24	22	9	A09A24			01								
A10-2A33/2C33	11	A12-2B30/2D30	11	5	A12B80			01								
A10-2A35/2C35	11	A11-2A42/2C42	11	4	A11A92			01								
A10-2A36/2C36	11	A11-1A33/1C33	11	8	A10A86			01								
A10-2A37/2C37	11	A11-2A31/2C31	11	4	A10A87			01								
A10-2A38/2C38	11	A11-1B07/1D07	11	11	A11B07			01								
A10-2A40/2C40	22	A09-1B42/1D42	22	8	A09B42			01								
A10-2A41/2C41	11	A08-1B40/1D40	11	8	A08B40			01								
A10-2A42/2C42	22	A13-1B21/1D21	22	10	A08A17			01								
A10-2A43/2C43	11	A13-2B12/2D12	11	6	A10A93			01								
A10-2B03/2D03	11	A11-2B38/2D38	11	6	A10B53			01								
A10-2B04/----		A10-2D04/----			GRNDXX			01								
A10-2B05/2D05	11	A11-2A32/2C32	11	6	A10B55			01								
A10-2B08/2D08	11	A09-2A05/2C05	11	4	A09A55			01								
A10-2B09/2D09	11	A12-1B27/1D27	11	6	A09B31			01								
A10-2B10/2D10	11	A12-1A27/1C27	11	7	A09A31			01								
A10-2B11/2D11	11	A12-1A26/1C26	11	7	A09A30			01								
A10-2B12/2D12	11	A11-2B40/2D40	11	6	A10B62			01								
A10-2B13/2D13	11	A11-2A43/2C43	11	6	A10B63			01								
A10-2B14/2D14	11	A11-1B30/1D30	11	7	A11B30			01								
A10-2B15/2D15	11	A12-1A25/1C25	11	7	A09A29			01								
A10-2B16/2D16	11	A12-1A24/1C24	11	7	A09A28			01								
A10-2B17/2D17	11	A11-2B30/2D30	11	5	A11B80			01								
A10-2B18/----		A10-2D18/----			GRNDXX			01								
A10-2B21/----		A10-2D21/----			GRNDXX			01								
A10-2B22/2D22	11	A13-2A05/2C05	11	6	A10B72			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A10-2B24/2D24	11	A08-1A40/1C40	11	7	A02B79			01				
A10-2B24/2D24	22	A11-1B29/1D29	22	8	A02B79			01				
A10-2B25/2D25	11	A07-1A40/1C40	11	7	A07A40			01				
A10-2B26/2D26	11	A04-1B32/1D32	11	9	A04B32			01				
A10-2B27/2D27	22	A13-1A27/1C27	22	8	A09A27			01				
A10-2B28/2D28	22	A13-1A26/1C26	22	9	A09A26			01				
A10-2B30/2D30	22	A13-1B25/1D25	22	9	A09B25			01				
A10-2B31/2D31	22	A13-1A25/1C25	22	9	A09A25			01				
A10-2B32/2D32	11	A11-2A03/2C03	11	5	A11A53			01				
A10-2B33/2D33	11	A13-2B03/2D03	11	6	A13B53			01				
A10-2B34/2D34	11	A07-1B33/1D33	11	8	A07B33			01				
A10-2B35/2D35	11	A11-2A41/2C41	11	4	A11A91			01				
A10-2B36/2D36	11	A11-1B33/1D33	11	8	A10B86			01				
A10-2B37/2D37	11	A11-1A29/1C29	11	9	A11A29			01				
A10-2B38/2D38	11	A13-1B35/1D35	11	9	A10B88			01				
A10-2B40/2D40	11	A09-1A43/1C43	11	8	A09A43			01				
A10-2B41/2D41	11	A08-2A33/2C33	11	5	A08A83			01				
A10-2B41/2D41	22	A11-2A16/2C16	22	6	A08A83			01				
A10-2B42/2D42	11	A13-2A12/2C12	11	6	A10B92			01				
A10-2B43/2D43	11	A13-1B18/1D18	11	11	A10B93			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A11-1A03/1C03	11	A04-2B27/2D27	11	13	A04B77			01				
A11-1A04/1C04	11	A04-2B11/2D11	11	13	A04B61			01				
A11-1A05/1C05	11	A04-2A33/2C33	11	13	A04A83			01				
A11-1A05/1C05	22	A12-1A05/1C05	22	4	A04A83			01				
A11-1A07/1C07	11	A09-1A32/1C32	11	6	A11A07			01				
A11-1A08/1C08	11	A14-1A08/1C08	11	5	A04A08			01				
A11-1A08/1C08	22	A07-1A08/1C08	22	6	A04A08			01				
A11-1A09/1C09	11	A14-1A09/1C09	11	5	A04A09			01				
A11-1A09/1C09	22	A07-1A09/1C09	22	6	A04A09			01				
A11-1A10/1C10	11	A14-1A10/1C10	11	5	A04A10			01				
A11-1A10/1C10	22	A07-1A10/1C10	22	6	A04A10			01				
A11-1A11/1C11	11	A14-1A11/1C11	11	5	A04A11			01				
A11-1A11/1C11	22	A07-1A11/1C11	22	6	A04A11			01				
A11-1A12/1C12	11	A08-2B34/2D34	11	10	A08B84			01				
A11-1A12/1C12	22	A12-1A12/1C12	22	4	A08B84			01				
A11-1A13/1C13	11	A08-1B33/1D33	11	6	A11A13			01				
A11-1A14/1C14	11	A11-1A19/1C19	11	4	A11A14			01				
A11-1A15/1C15	11	A13-2B26/2D26	11	9	A11A15			01				
A11-1A16/1C16	11	A14-1A16/1C16	11	5	A04A16			01				
A11-1A16/1C16	22	A07-1A16/1C16	22	6	A04A16			01				
A11-1A17/1C17	11	A13-2B34/2D34	11	10	A11A17			01				
A11-1A18/1C18	11	A13-2A27/2C27	11	9	A11A18			01				
A11-1A19/1C19	11	A11-1A14/1C14	11	4	A11A14			01				
A11-1A20/1C20	11	A13-2B30/2D30	11	9	A11A20			01				
A11-1A21/1C21	11	A09-2A03/2C03	11	6	A11A21			01				
A11-1A22/1C22	22	A10-1A42/1C42	22	6	A10A42			01				
A11-1A24/1C24	11	A13-1A24/1C24	11	5	A09A24			01				
A11-1A24/1C24	22	A09-1A24/1C24	22	5	A09A24			01				
A11-1A25/1C25	11	A13-1A25/1C25	11	5	A09A25			01				
A11-1A25/1C25	22	A09-1A25/1C25	22	5	A09A25			01				
A11-1A26/1C26	11	A13-1A26/1C26	11	5	A09A26			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A11-1A26/1C26	22	A09-1A26/1C26	22	5	A09A26			01				
A11-1A27/1C27	11	A13-1A27/1C27	11	5	A09A27			01				
A11-1A27/1C27	22	A09-1A27/1C27	22	5	A09A27			01				
A11-1A28/1C28	11	A10-1B40/1D40	11	5	A11A83			01				
A11-1A28/1C28	22	A12-1A28/1C28	22	4	A11A83			01				
A11-1A29/1C29	11	A10-2B37/2D37	11	9	A11A29			01				
A11-1A30/1C30	11	A10-2A13/2C13	11	6	A11A30			01				
A11-1A31/1C31	11	A10-1A21/1C21	11	5	A11A31			01				
A11-1A32/1C32	11	A10-2A19/2C19	11	7	A11A32			01				
A11-1A33/1C33	11	A10-2A36/2C36	11	8	A10A86			01				
A11-1A35/1C35	11	A09-1B35/1D35	11	4	A09B35			01				
A11-1A35/1C35	22	A12-1A35/1C35	22	4	A09B35			01				
A11-1A36/1C36	11	A12-1A19/1C19	11	5	A11A36			01				
A11-1A37/1C37	11	A10-2A29/2C29	11	7	A11A37			01				
A11-1A38/1C38	11	A10-2A11/2C11	11	6	A11A38			01				
A11-1A40/1C40	11	A10-2A12/2C12	11	6	A10A62			01				
A11-1A41/1C41	11	A12-1A41/1C41	11	4	A09B55			01				
A11-1A41/1C41	22	A09-2B05/2D05	22	6	A09B55			01				
A11-1A42/1C42	11	A08-1B17/1D17	11	6	A08B17			01				
A11-1A43/1C43	11	A10-1A33/1C33	11	5	A11A43			01				
A11-1B03/1D03	11	A04-2B19/2D19	11	13	A04B69			01				
A11-1B04/1D04	11	A04-1A32/1C32	11	13	A04A32			01				
A11-1B05/1D05	22	A08-1B05/1D05	22	4	A04A79			01				
A11-1B07/1D07	11	A10-2A38/2C38	11	11	A11B07			01				
A11-1B08/1D08	11	A14-1B08/1D08	11	5	A04B08			01				
A11-1B08/1D08	22	A07-1B08/1D08	22	6	A04B08			01				
A11-1B09/1D09	11	A14-1B09/1D09	11	5	A04B09			01				
A11-1B09/1D09	22	A07-1B09/1D09	22	6	A04B09			01				
A11-1B10/1D10	11	A14-1B10/1D10	11	5	A04B10			01				
A11-1B10/1D10	22	A07-1B10/1D10	22	6	A04B10			01				
A11-1B11/1D11	11	A14-1B11/1D11	11	5	A04B11			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A11-1B11/1D11	22	A07-1B11/1D11	22	6	A04B11			01				
A11-1B12/1D12	11	A07-1B38/1D38	11	6	A07B38			01				
A11-1B12/1D12	22	A12-1B12/1D12	22	4	A07B38			01				
A11-1B13/1D13	11	A12-1B32/1D32	11	5	A12B32			01				
A11-1B14/1D14	11	A13-2A26/2C26	11	9	A11B14			01				
A11-1B15/1D15	11	A13-2B29/2D29	11	10	A11B15			01				
A11-1B16/1D16	11	A13-2A29/2C29	11	9	A11B16			01				
A11-1B17/1D17	11	A11-1B34/1D34	11	5	A11B17			01				
A11-1B18/1D18	11	A09-1A12/1C12	11	5	A11B18			01				
A11-1B19/1D19	11	A13-2B27/2D27	11	9	A11B19			01				
A11-1B20/1D20	11	A11-2B25/2D25	11	9	A11B75			01				
A11-1B21/1D21	11	A13-2A30/2C30	11	9	A11B21			01				
A11-1B24/1D24	11	A13-1B24/1D24	11	5	A09B24			01				
A11-1B24/1D24	22	A09-1B24/1D24	22	5	A09B24			01				
A11-1B25/1D25	11	A13-1B25/1D25	11	5	A09B25			01				
A11-1B25/1D25	22	A09-1B25/1D25	22	5	A09B25			01				
A11-1B26/1D26	11	A13-1B26/1D26	11	5	A09B26			01				
A11-1B26/1D26	22	A09-1B26/1D26	22	5	A09B26			01				
A11-1B27/1D27	11	A13-1B27/1D27	11	5	A09B27			01				
A11-1B27/1D27	22	A09-1B27/1D27	22	5	A09B27			01				
A11-1B28/1D28	11	A10-2A28/2C28	11	8	A11B28			01				
A11-1B29/1D29	22	A10-2B24/2D24	22	8	A02B79			01				
A11-1B30/1D30	11	A10-2B14/2D14	11	7	A11B30			01				
A11-1B33/1D33	11	A10-2B36/2D36	11	8	A10B86			01				
A11-1B34/1D34	11	A11-1B17/1D17	11	5	A11B17			01				
A11-1B34/1D34	22	A12-1B34/1D34	22	4	A11B17			01				
A11-1B36/1D36	11	A12-1B37/1D37	11	4	A12B37			01				
A11-1B38/1D38	11	A10-1B36/1D36	11	4	A11B38			01				
A11-1B40/1D40	22	A10-2A25/2C25	22	7	A08A55			01				
A11-1B41/1D41	11	A09-1A40/1C40	11	5	A09A40			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A11-1B42/1D42	11	A09-2B20/2D20	11	6	A09B70			01								
A11-1B43/1D43	11	A10-1A36/1C36	11	5	A11B43			01								
A11-2A03/2C03	11	A10-2B32/2D32	11	5	A11A53			01								
A11-2A04/2C04	11	A13-1B37/1D37	11	6	A13B37			01								
A11-2A05/2C05	11	A13-1A40/1C40	11	6	A13A40			01								
A11-2A07/2C07	11	A13-2A07/2C07	11	5	A09A57			01								
A11-2A07/2C07	22	A09-2A07/2C07	22	5	A09A57			01								
A11-2A08/2C08	11	A13-2A08/2C08	11	5	A09A58			01								
A11-2A08/2C08	22	A09-2A08/2C08	22	5	A09A58			01								
A11-2A09/2C09	11	A13-2A09/2C09	11	5	A09A59			01								
A11-2A09/2C09	22	A09-2A09/2C09	22	5	A09A59			01								
A11-2A10/2C10	11	A13-2A10/2C10	11	5	A09A60			01								
A11-2A10/2C10	22	A09-2A10/2C10	22	5	A09A60			01								
A11-2A11/2C11	11	A13-1A38/1C38	11	6	A13A38			01								
A11-2A12/2C12	11	A13-1B42/1D42	11	6	A13B42			01								
A11-2A13/2C13	11	A09-2A17/2C17	11	5	A11A63			01								
A11-2A14/2C14	22	A10-2A22/2C22	22	4	A11A64			01								
A11-2A15/2C15	11	A10-1B32/1D32	11	6	A11A65			01								
A11-2A16/2C16	22	A10-2B41/2D41	22	6	A08A83			01								
A11-2A17/2C17	11	A12-2A17/2C17	11	4	A09B41			01								
A11-2A17/2C17	22	A08-1B36/1D36	22	7	A09B41			01								
A11-2A18/2C18	11	A08-1A38/1C38	11	7	A08A38			01								
A11-2A18/2C18	22	A10-1A40/1C40	22	6	A08A38			01								
A11-2A24/2C24	11	A13-1B10/1D10	11	10	A13B10			01								
A11-2A25/2C25	11	A12-1B20/1D20	11	9	A11A75			01								
A11-2A27/----		A11-2C27/----			GRNDXX			01								
A11-2A30/2C30	11	A10-2A09/2C09	11	6	A11A80			01								
A11-2A31/2C31	11	A10-2A37/2C37	11	4	A10A87			01								
A11-2A32/2C32	11	A10-2B05/2D05	11	6	A10B55			01								
A11-2A33/2C33	22	A13-2A16/2C16	22	6	A11A83			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A11-2A34/2C34	11	A08-2A34/2C34	11	5	A04A84			01								
A11-2A34/2C34	22	A14-2A34/2C34	22	5	A04A84			01								
A11-2A35/----		A11-2C35/----			GRNDXX			01								
A11-2A37/2C37	11	A10-2A18/2C18	11	5	A11A87			01								
A11-2A41/2C41	11	A10-2B35/2D35	11	4	A11A91			01								
A11-2A42/2C42	11	A10-2A35/2C35	11	4	A11A92			01								
A11-2A43/2C43	11	A10-2B13/2D13	11	6	A10B63			01								
A11-2B03/2D03	11	A09-2A20/2C20	11	6	A09A70			01								
A11-2B03/2D03	22	A12-2B03/2D03	22	4	A09A70			01								
A11-2B04/2D04	11	A13-1B41/1D41	11	6	A13B41			01								
A11-2B05/2D05	11	A13-1B40/1D40	11	6	A13B40			01								
A11-2B07/2D07	11	A13-2B07/2D07	11	5	A09B57			01								
A11-2B07/2D07	22	A09-2B07/2D07	22	5	A09B57			01								
A11-2B08/2D08	11	A13-2B08/2D08	11	5	A09B58			01								
A11-2B08/2D08	22	A09-2B08/2D08	22	5	A09B58			01								
A11-2B09/2D09	11	A13-2B09/2D09	11	5	A09B59			01								
A11-2B09/2D09	22	A09-2B09/2D09	22	5	A09B59			01								
A11-2B10/2D10	11	A13-2B10/2D10	11	5	A09B60			01								
A11-2B10/2D10	22	A09-2B10/2D10	22	5	A09B60			01								
A11-2B11/2D11	11	A13-1A41/1C41	11	6	A13A41			01								
A11-2B12/2D12	11	A13-1A42/1C42	11	6	A13A42			01								
A11-2B13/2D13	11	A09-2A21/2C21	11	5	A09A71			01								
A11-2B13/2D13	22	A13-1B12/1D12	22	8	A09A71			01								
A11-2B14/2D14	11	A10-1B43/1D43	11	6	A10B43			01								
A11-2B14/2D14	22	A12-2B14/2D14	22	4	A10B43			01								
A11-2B15/2D15	11	A09-2A22/2C22	11	5	A09A72			01								
A11-2B15/2D15	22	A12-2B15/2D15	22	4	A09A72			01								
A11-2B16/2D16	11	A12-2B16/2D16	11	4	A09B37			01								
A11-2B16/2D16	22	A08-1A33/1C33	22	7	A09B37			01								
A11-2B17/2D17	11	A12-2B17/2D17	11	4	A09A41			01								
A11-2B17/2D17	22	A08-1A36/1C36	22	7	A09A41			01								
A11-2B18/2D18	11	A12-2B18/2D18	11	4	A09A42			01								
A11-2B18/2D18	22	A08-1A37/1C37	22	7	A09A42			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A11-2B22/2D22	11	A13-1A37/1C37	11	7	A13A37			01							
A11-2B25/2D25	11	A11-1B20/1D20	11	9	A11B75			01							
A11-2B26/2D26	22	A02-1B36/1D36	22	10	A02B36			01							
A11-2B27/----		A11-2D27/----			GRNDXX			01							
A11-2B28/2D28	11	A13-2A03/2C03	11	6	A13A53			01							
A11-2B29/2D29	11	A12-2A29/2C29	11	4	A12A79			01							
A11-2B30/2D30	11	A10-2B17/2D17	11	5	A11B80			01							
A11-2B31/2D31	11	A12-2B31/2D31	11	4	A04B81			01							
A11-2B31/2D31	22	A09-2B31/2D31	22	5	A04B81			01							
A11-2B32/2D32	11	A08-1A35/1C35	11	8	A08A35			01							
A11-2B33/2D33	11	A14-2B33/2D33	11	5	A04B83			01							
A11-2B33/2D33	22	A07-2B33/2D33	22	6	A04B83			01							
A11-2B34/2D34	11	A14-2B34/2D34	11	5	A04B84			01							
A11-2B34/2D34	22	A07-2B34/2D34	22	6	A04B84			01							
A11-2B35/2D35	22	A10-2A07/2C07	22	5	A08B08			01							
A11-2B36/2D36	11	A09-2A27/2C27	11	5	A09A77			01							
A11-2B36/2D36	22	A12-2B36/2D36	22	4	A09A77			01							
A11-2B37/2D37	11	A10-2A17/2C17	11	6	A11B87			01							
A11-2B38/2D38	11	A10-2B03/2D03	11	6	A10B53			01							
A11-2B38/2D38	22	A12-2B38/2D38	22	4	A10B53			01							
A11-2B40/2D40	11	A10-2B12/2D12	11	6	A10B62			01							
A11-2B41/2D41	22	A13-2A05/2C05	22	6	A10B72			01							
A11-2B42/2D42	11	A10-2A05/2C05	11	6	A11B92			01							
A11-2B43/2D43	11	A10-1B18/1D18	11	11	A11B93			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A12-1A05/1C05	22	A11-1A05/1C05	22	4	A04A83			01				
A12-1A08/1C08	11	A14-1A12/1C12	11	5	A04A12			01				
A12-1A08/1C08	22	A07-1A12/1C12	22	6	A04A12			01				
A12-1A09/1C09	11	A14-1A13/1C13	11	5	A04A13			01				
A12-1A09/1C09	22	A07-1A13/1C13	22	6	A04A13			01				
A12-1A10/1C10	11	A14-1A14/1C14	11	5	A04A14			01				
A12-1A10/1C10	22	A07-1A14/1C14	22	6	A04A14			01				
A12-1A11/1C11	11	A14-1A15/1C15	11	5	A04A15			01				
A12-1A11/1C11	22	A07-1A15/1C15	22	6	A04A15			01				
A12-1A12/1C12	22	A11-1A12/1C12	22	4	A08B84			01				
A12-1A13/1C13	11	A10-2A03/2C03	11	7	A12A13			01				
A12-1A15/1C15	11	A13-1B14/1D14	11	4	A12A15			01				
A12-1A16/1C16	11	A14-1B16/1D16	11	5	A04B16			01				
A12-1A16/1C16	22	A07-1B16/1D16	22	6	A04B16			01				
A12-1A17/1C17	11	A13-1A11/1C11	11	4	A12A17			01				
A12-1A18/1C18	11	A13-1B19/1D19	11	4	A12A18			01				
A12-1A19/1C19	11	A11-1A36/1C36	11	5	A11A36			01				
A12-1A20/1C20	11	A13-1B20/1D20	11	4	A12A20			01				
A12-1A24/1C24	11	A10-2B16/2D16	11	7	A09A28			01				
A12-1A24/1C24	22	A09-1A28/1C28	22	5	A09A28			01				
A12-1A25/1C25	11	A10-2B15/2D15	11	7	A09A29			01				
A12-1A25/1C25	22	A09-1A29/1C29	22	5	A09A29			01				
A12-1A26/1C26	11	A10-2B11/2D11	11	7	A09A30			01				
A12-1A26/1C26	22	A09-1A30/1C30	22	5	A09A30			01				
A12-1A27/1C27	11	A10-2B10/2D10	11	7	A09A31			01				
A12-1A27/1C27	22	A09-1A31/1C31	22	5	A09A31			01				
A12-1A28/1C28	11	A13-2A16/2C16	11	7	A11A83			01				
A12-1A28/1C28	22	A11-1A28/1C28	22	4	A11A83			01				
A12-1A35/1C35	22	A11-1A35/1C35	22	4	A09B35			01				
A12-1A40/----		A12-1C40/----			GRNDXX			01				
A12-1A41/1C41	11	A11-1A41/1C41	11	4	A09B55			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A12-1B08/1D08	11	A14-1B12/1D12	11	5	A04B12			01				
A12-1B08/1D08	22	A07-1B12/1D12	22	6	A04B12			01				
A12-1B09/1D09	11	A14-1B13/1D13	11	5	A04B13			01				
A12-1B09/1D09	22	A07-1B13/1D13	22	6	A04B13			01				
A12-1B10/1D10	11	A14-1B14/1D14	11	5	A04B14			01				
A12-1B10/1D10	22	A07-1B14/1D14	22	6	A04B14			01				
A12-1B11/1D11	11	A14-1B15/1D15	11	5	A04B15			01				
A12-1B11/1D11	22	A07-1B15/1D15	22	6	A04B15			01				
A12-1B12/1D12	22	A11-1B12/1D12	22	4	A07B38			01				
A12-1B14/1D14	11	A13-1A13/1C13	11	4	A12B14			01				
A12-1B15/1D15	11	A13-1A14/1C14	11	4	A12B15			01				
A12-1B16/1D16	11	A13-1B15/1D15	11	4	A12B16			01				
A12-1B19/1D19	11	A13-1A19/1C19	11	4	A12B19			01				
A12-1B20/1D20	11	A11-2A25/2C25	11	9	A11A75			01				
A12-1B21/1D21	11	A13-1A20/1C20	11	4	A12B21			01				
A12-1B24/1D24	11	A10-2A15/2C15	11	7	A09B28			01				
A12-1B24/1D24	22	A09-1B28/1D28	22	5	A09B28			01				
A12-1B25/1D25	11	A10-2A14/2C14	11	7	A09B29			01				
A12-1B25/1D25	22	A09-1B29/1D29	22	5	A09B29			01				
A12-1B26/1D26	11	A10-2A10/2C10	11	7	A09B30			01				
A12-1B26/1D26	22	A09-1B30/1D30	22	5	A09B30			01				
A12-1B27/1D27	11	A10-2B09/2D09	11	6	A09B31			01				
A12-1B27/1D27	22	A09-1B31/1D31	22	5	A09B31			01				
A12-1B28/1D28	11	A10-2A16/2C16	11	7	A12B28			01				
A12-1B32/1D32	11	A11-1B13/1D13	11	5	A12B32			01				
A12-1B34/1D34	22	A11-1B34/1D34	22	4	A11B17			01				
A12-1B37/1D37	11	A11-1B36/1D36	11	4	A12B37			01				
A12-1B41/1D41	11	A09-1B38/1D38	11	5	A09B38			01				
A12-2A04/2C04	11	A13-2B32/2D32	11	6	A13B82			01				
A12-2A05/2C05	11	A13-2A38/2C38	11	6	A13A88			01				
A12-2A07/2C07	22	A09-2A11/2C11	22	5	A09A61			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A12-2A08/2C08	22	A09-2A12/2C12	22	5	A09A62			01								
A12-2A09/2C09	22	A09-2A13/2C13	22	5	A09A63			01								
A12-2A10/2C10	22	A09-2A14/2C14	22	5	A09A64			01								
A12-2A11/2C11	11	A13-2A35/2C35	11	6	A13A85			01								
A12-2A12/2C12	11	A13-2B40/2D40	11	6	A13B90			01								
A12-2A17/2C17	11	A11-2A17/2C17	11	4	A09B41			01								
A12-2A27/----		A12-2C27/----			GRNDXX			01								
A12-2A29/2C29	11	A11-2B29/2D29	11	4	A12A79			01								
A12-2A31/2C31	11	A10-1B26/1D26	11	9	A10B26			01								
A12-2A35/----		A12-2C35/----			GRNDXX			01								
A12-2A38/2C38	22	A10-1B24/1D24	22	10	A12A88			01								
A12-2B03/2D03	22	A11-2B03/2D03	22	4	A09A70			01								
A12-2B04/2D04	11	A13-2A32/2C32	11	6	A13A82			01								
A12-2B05/2D05	11	A13-2A36/2C36	11	6	A13A86			01								
A12-2B07/2D07	22	A09-2B11/2D11	22	5	A09B61			01								
A12-2B08/2D08	22	A09-2B12/2D12	22	5	A09B62			01								
A12-2B09/2D09	22	A09-2B13/2D13	22	5	A09B63			01								
A12-2B10/2D10	22	A09-2B14/2D14	22	5	A09B64			01								
A12-2B11/2D11	11	A13-2B42/2D42	11	6	A13B92			01								
A12-2B12/2D12	11	A13-2B38/2D38	11	6	A13B88			01								
A12-2B14/2D14	22	A11-2B14/2D14	22	4	A10B43			01								
A12-2B15/2D15	22	A11-2B15/2D15	22	4	A09A72			01								
A12-2B16/2D16	11	A11-2B16/2D16	11	4	A09B37			01								
A12-2B17/2D17	11	A11-2B17/2D17	11	4	A09A41			01								
A12-2B18/2D18	11	A11-2B18/2D18	11	4	A09A42			01								
A12-2B22/2D22	11	A13-2A33/2C33	11	5	A13A83			01								
A12-2B27/----		A12-2D27/----			GRNDXX			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A12-2B28/2D28	11	A13-1A10/1C10	11	10	A13A10			01						
A12-2B30/2D30	11	A10-2A33/2C33	11	5	A12B80			01						
A12-2B31/2D31	11	A11-2B31/2D31	11	4	A04B81			01						
A12-2B31/2D31	22	A14-2B31/2D31	22	5	A04B81			01						
A12-2B36/2D36	22	A11-2B36/2D36	22	4	A09A77			01						
A12-2B38/2D38	22	A11-2B38/2D38	22	4	A10B53			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A13-1A09/1C09	11	A07-1A22/1C22	11	6	A07A22			01							
A13-1A10/1C10	11	A12-2B28/2D28	11	10	A13A10			01							
A13-1A11/1C11	11	A12-1A17/1C17	11	4	A12A17			01							
A13-1A12/1C12	11	A10-2A04/2C04	11	8	A10A54			01							
A13-1A13/1C13	11	A12-1B14/1D14	11	4	A12B14			01							
A13-1A14/1C14	11	A12-1B15/1D15	11	4	A12B15			01							
A13-1A16/1C16	11	A07-1B26/1D26	11	6	A07B26			01							
A13-1A17/1C17	11	A07-1B27/1D27	11	6	A07B27			01							
A13-1A18/1C18	11	A07-1B28/1D28	11	6	A07B28			01							
A13-1A19/1C19	11	A12-1B19/1D19	11	4	A12B19			01							
A13-1A20/1C20	11	A12-1B21/1D21	11	4	A12B21			01							
A13-1A21/1C21	11	A09-2A33/2C33	11	10	A09A83			01							
A13-1A22/1C22	11	A09-1A35/1C35	11	6	A09A35			01							
A13-1A24/1C24	11	A11-1A24/1C24	11	5	A09A24			01							
A13-1A24/1C24	22	A10-2A32/2C32	22	9	A09A24			01							
A13-1A25/1C25	11	A11-1A25/1C25	11	5	A09A25			01							
A13-1A25/1C25	22	A10-2B31/2D31	22	9	A09A25			01							
A13-1A26/1C26	11	A11-1A26/1C26	11	5	A09A26			01							
A13-1A26/1C26	22	A10-2B28/2D28	22	9	A09A26			01							
A13-1A27/1C27	11	A11-1A27/1C27	11	5	A09A27			01							
A13-1A27/1C27	22	A10-2B27/2D27	22	8	A09A27			01							
A13-1A28/1C28	11	A07-1A24/1C24	11	6	A07A24			01							
A13-1A29/1C29	11	A07-1A25/1C25	11	6	A07A25			01							
A13-1A30/1C30	11	A10-1A32/1C32	11	5	A10A32			01							
A13-1A31/1C31	11	A07-1A26/1C26	11	6	A07A26			01							
A13-1A32/1C32	11	A07-1A27/1C27	11	6	A07A27			01							
A13-1A33/1C33	11	A07-1A28/1C28	11	6	A07A28			01							
A13-1A34/1C34	11	A07-1B30/1D30	11	6	A07B30			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A13-1A37/1C37	11	A11-2B22/2D22	11	7	A13A37			01								
A13-1A38/1C38	11	A11-2A11/2C11	11	6	A13A38			01								
A13-1A40/1C40	11	A11-2A05/2C05	11	6	A13A40			01								
A13-1A41/1C41	11	A11-2B11/2D11	11	6	A13A41			01								
A13-1A42/1C42	11	A11-2B12/2D12	11	6	A13A42			01								
A13-1B04/----		A13-1D04/----			GRNDXX			01								
A13-1B08/----		A13-1D08/----			GRNDXX			01								
A13-1B10/1D10	11	A11-2A24/2C24	11	10	A13B10			01								
A13-1B12/1D12	22	A11-2B13/2D13	22	8	A09A71			01								
A13-1B13/1D13	11	A10-2A08/2C08	11	8	A13B13			01								
A13-1B14/1D14	11	A12-1A15/1C15	11	4	A12A15			01								
A13-1B15/1D15	11	A12-1B16/1D16	11	4	A12B16			01								
A13-1B16/----		A13-1D16/----			GRNDXX			01								
A13-1B18/1D18	11	A10-2B43/2D43	11	11	A10B93			01								
A13-1B19/1D19	11	A12-1A18/1C18	11	4	A12A18			01								
A13-1B20/1D20	11	A12-1A20/1C20	11	4	A12A20			01								
A13-1B21/1D21	11	A08-1A17/1C17	11	6	A08A17			01								
A13-1B21/1D21	22	A10-2A42/2C42	22	10	A08A17			01								
A13-1B22/1D22	11	A09-2B33/2D33	11	10	A09B83			01								
A13-1B24/1D24	11	A11-1B24/1D24	11	5	A09B24			01								
A13-1B24/1D24	22	A10-2A31/2C31	22	9	A09B24			01								
A13-1B25/1D25	11	A11-1B25/1D25	11	5	A09B25			01								
A13-1B25/1D25	22	A10-2B30/2D30	22	9	A09B25			01								
A13-1B26/1D26	11	A11-1B26/1D26	11	5	A09B26			01								
A13-1B26/1D26	22	A10-2A27/2C27	22	9	A09B26			01								
A13-1B27/1D27	11	A11-1B27/1D27	11	5	A09B27			01								
A13-1B27/1D27	22	A10-2A26/2C26	22	8	A09B27			01								
A13-1B30/1D30	11	A08-1A34/1C34	11	6	A08A34			01								
A13-1B33/1D33	11	A08-1B34/1D34	11	6	A08B34			01								
A13-1B35/1D35	11	A10-2B38/2D38	11	9	A10B88			01								

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	A13-1B37/1D37	11	A11-2A04/2C04	11	6	A13B37			01						
	A13-1B40/1D40	11	A11-2B05/2D05	11	6	A13B40			01						
	A13-1B41/1D41	11	A11-2B04/2D04	11	6	A13B41			01						
	A13-1B42/1D42	11	A11-2A12/2C12	11	6	A13B42			01						
	A13-2A03/2C03	11	A11-2B28/2D28	11	6	A13A53			01						
	A13-2A05/2C05	11	A10-2B22/2D22	11	6	A10B72			01						
	A13-2A05/2C05	22	A11-2B41/2D41	22	6	A10B72			01						
	A13-2A07/2C07	11	A11-2A07/2C07	11	5	A09A57			01						
	A13-2A08/2C08	11	A11-2A08/2C08	11	5	A09A58			01						
	A13-2A09/2C09	11	A11-2A09/2C09	11	5	A09A59			01						
	A13-2A10/2C10	11	A11-2A10/2C10	11	5	A09A60			01						
	A13-2A12/2C12	11	A10-2B42/2D42	11	6	A10B92			01						
	A13-2A16/2C16	11	A12-1A28/1C28	11	7	A11A83			01						
	A13-2A16/2C16	22	A11-2A33/2C33	22	6	A11A83			01						
	A13-2A17/2C17	11	A10-2A30/2C30	11	6	A13A67			01						
	A13-2A26/2C26	11	A11-1B14/1D14	11	9	A11B14			01						
	A13-2A27/2C27	11	A11-1A18/1C18	11	9	A11A18			01						
	A13-2A29/2C29	11	A11-1B16/1D16	11	9	A11B16			01						
	A13-2A30/2C30	11	A11-1B21/1D21	11	9	A11B21			01						
	A13-2A32/2C32	11	A12-2B04/2D04	11	6	A13A82			01						
	A13-2A33/2C33	11	A12-2B22/2D22	11	5	A13A83			01						
	A13-2A35/2C35	11	A12-2A11/2C11	11	6	A13A85			01						
	A13-2A36/2C36	11	A12-2B05/2D05	11	6	A13A86			01						
	A13-2A38/2C38	11	A12-2A05/2C05	11	6	A13A88			01						
	A13-2A41/2C41	11	A08-2A03/2C03	11	7	A08A53			01						
	A13-2A43/2C43	11	A09-2A24/2C24	11	6	A09A74			01						
	A13-2B03/2D03	11	A10-2B33/2D33	11	6	A13B53			01						
	A13-2B07/2D07	11	A11-2B07/2D07	11	5	A09B57			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A13-2B08/2D08	11	A11-2B08/2D08	11	5	A09B58			01								
A13-2B09/2D09	11	A11-2B09/2D09	11	5	A09B59			01								
A13-2B10/2D10	11	A11-2B10/2D10	11	5	A09B60			01								
A13-2B11/2D11	11	A09-2B21/2D21	11	6	A09B71			01								
A13-2B12/2D12	11	A10-2A43/2C43	11	6	A10A93			01								
A13-2B16/----		A13-2D16/----			GRNDXX			01								
A13-2B17/2D17	11	A09-2B24/2D24	11	6	A09B74			01								
A13-2B18/----		A13-2D18/----			GRNDXX			01								
A13-2B20/2D20	11	A09-2A25/2C25	11	6	A09A75			01								
A13-2B26/2D26	11	A11-1A15/1C15	11	9	A11A15			01								
A13-2B27/2D27	11	A11-1B19/1D19	11	9	A11B19			01								
A13-2B29/2D29	11	A11-1B15/1D15	11	10	A11B15			01								
A13-2B30/2D30	11	A11-1A20/1C20	11	9	A11A20			01								
A13-2B31/2D31	11	A10-1B25/1D25	11	9	A10B25			01								
A13-2B32/2D32	11	A12-2A04/2C04	11	6	A13B82			01								
A13-2B33/2D33	11	A08-2A04/2C04	11	7	A08A54			01								
A13-2B34/2D34	11	A11-1A17/1C17	11	10	A11A17			01								
A13-2B35/2D35	11	A09-2B26/2D26	11	6	A09B76			01								
A13-2B36/2D36	11	A09-2B34/2D34	11	6	A09B84			01								
A13-2B37/----		A13-2D37/----			GRNDXX			01								
A13-2B38/2D38	11	A12-2B12/2D12	11	6	A13B88			01								
A13-2B40/2D40	11	A12-2A12/2C12	11	6	A13B90			01								
A13-2B42/2D42	11	A12-2B11/2D11	11	6	A13B92			01								
A13-2B43/2D43	11	A08-2B03/2D03	11	7	A08B53			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A14-1A03/1C03	11	A04-2B28/2D28	11	13	A04B78			01						
A14-1A04/1C04	11	A04-2A12/2C12	11	13	A04A62			01						
A14-1A08/1C08	11	A11-1A08/1C08	11	5	A04A08			01						
A14-1A09/1C09	11	A11-1A09/1C09	11	5	A04A09			01						
A14-1A10/1C10	11	A11-1A10/1C10	11	5	A04A10			01						
A14-1A11/1C11	11	A11-1A11/1C11	11	5	A04A11			01						
A14-1A12/1C12	11	A12-1A08/1C08	11	5	A04A12			01						
A14-1A13/1C13	11	A12-1A09/1C09	11	5	A04A13			01						
A14-1A14/1C14	11	A12-1A10/1C10	11	5	A04A14			01						
A14-1A15/1C15	11	A12-1A11/1C11	11	5	A04A15			01						
A14-1A16/1C16	11	A11-1A16/1C16	11	5	A04A16			01						
A14-1A17/1C17	11	A06-2A13/2C13	11	10	A14A17			01						
A14-1A18/1C18	11	A05-2B26/2D26	11	11	A05B76			01						
A14-1A19/1C19	11	A05-2B25/2D25	11	11	A05B75			01						
A14-1A20/1C20	11	A18-2B28/2D28	11	13	A18B78			01						
A14-1A21/1C21	11	A18-2A12/2C12	11	13	A18A62			01						
A14-1A29/1C29	22	A16-1A08/1C08	22	6	A18A08			01						
A14-1A30/1C30	22	A16-1A09/1C09	22	6	A18A09			01						
A14-1A31/1C31	22	A16-1A10/1C10	22	6	A18A10			01						
A14-1A32/1C32	22	A16-1A11/1C11	22	6	A18A11			01						
A14-1A33/1C33	22	A16-1A12/1C12	22	6	A18A12			01						
A14-1A34/1C34	22	A16-1A13/1C13	22	6	A18A13			01						
A14-1A35/1C35	22	A16-1A14/1C14	22	6	A18A14			01						
A14-1A36/1C36	22	A16-1A15/1C15	22	6	A18A15			01						
A14-1A37/1C37	22	A16-1A16/1C16	22	6	A18A16			01						
A14-1A38/1C38	11	A20-2A13/2C13	11	7	A14A38			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A14-1A40/1C40	11	A19-2B26/2D26	11	8	A19B76			01				
A14-1A41/1C41	11	A19-2B25/2D25	11	8	A19B75			01				
A14-1B03/1D03	11	A04-2B20/2D20	11	13	A04B70			01				
A14-1B04/1D04	11	A04-1B33/1D33	11	13	A04B33			01				
A14-1B08/1D08	11	A11-1B08/1D08	11	5	A04B08			01				
A14-1B09/1D09	11	A11-1B09/1D09	11	5	A04B09			01				
A14-1B10/1D10	11	A11-1B10/1D10	11	5	A04B10			01				
A14-1B11/1D11	11	A11-1B11/1D11	11	5	A04B11			01				
A14-1B12/1D12	11	A12-1B08/1D08	11	5	A04B12			01				
A14-1B13/1D13	11	A12-1B09/1D09	11	5	A04B13			01				
A14-1B14/1D14	11	A12-1B10/1D10	11	5	A04B14			01				
A14-1B15/1D15	11	A12-1B11/1D11	11	5	A04B15			01				
A14-1B16/1D16	11	A12-1A16/1C16	11	5	A04B16			01				
A14-1B17/1D17	11	A06-2B13/2D13	11	10	A06B63			01				
A14-1B18/1D18	11	A05-2A26/2C26	11	11	A05A76			01				
A14-1B19/1D19	11	A05-2A25/2C25	11	11	A05A75			01				
A14-1B20/1D20	11	A18-2B20/2D20	11	13	A18B70			01				
A14-1B21/1D21	11	A18-1B33/1D33	11	6	A18B33			01				
A14-1B29*1D29	22	A16-1B08/1D08	22	6	A18B08			01				
A14-1B30/1D30	22	A16-1B09/1D09	22	6	A18B09			01				
A14-1B31/1D31	22	A16-1B10/1D10	22	6	A18B10			01				
A14-1B32/1D32	22	A16-1B11/1D11	22	6	A18B11			01				
A14-1B33/1D33	22	A16-1B12/1D12	22	6	A18B12			01				
A14-1B34/1D34	22	A16-1B13/1D13	22	6	A18B13			01				
A14-1B35/1D35	22	A16-1B14/1D14	22	6	A18B14			01				
A14-1B36/1D36	22	A16-1B15/1D15	22	6	A18B15			01				
A14-1B37/1D37	22	A16-1B16/1D16	22	6	A18B16			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A14-1B38/1D38	11	A20-2B13/2D13	11	7	A20B63			01				
A14-1B40/1D40	11	A19-2A26/2C26	11	8	A19A76			01				
A14-1B41/1D41	11	A19-2A25/2C25	11	7	A19A75			01				
A14-2A11/2C11	11	A07-1B37/1D37	11	7	A07B37			01				
A14-2A13/2C13	11	A20-2A14/2C14	11	6	A14A63			01				
A14-2A14/2C14	11	A06-2A14/2C14	11	7	A14A64			01				
A14-2A15/2C15	22	A17-2A30/2C30	22	6	A18A80			01				
A14-2A16/2C16	22	A17-2A31/2C31	22	6	A18A81			01				
A14-2A19/2C19	11	A16-2A34/2C34	11	5	A18A84			01				
A14-2A20*2C20	11	A17-2A35/2C35	11	6	A17A85			01				
A14-2A21*2C21	11	A17-2A36/2C36	11	6	A17A86			01				
A14-2A22*2C22	11	A17-2A37/2C37	11	6	A17A87			01				
A14-2A24*2C24	11	A17-2A38/2C38	11	6	A17A88			01				
A14-2A25*2C25	11	A17-2A40/2C40	11	6	A17A90			01				
A14-2A26*2C26	11	A17-2A41/2C41	11	6	A17A91			01				
A14-2A27*2C27	11	A17-2A42/2C42	11	6	A17A92			01				
A14-2A28*2C28	11	A17-2A43/2C43	11	6	A17A93			01				
A14-2A30/2C30	11	A06-2A30/2C30	11	7	A04A80			01				
A14-2A31/2C31	11	A06-2A31/2C31	11	7	A04A81			01				
A14-2A34/2C34	22	A11-2A34/2C34	22	5	A04A84			01				
A14-2A35/2C35	11	A09-2A35/2C35	11	6	A03A85			01				
A14-2A36/2C36	11	A09-2A36/2C36	11	6	A03A86			01				
A14-2A37/2C37	11	A09-2A37/2C37	11	6	A03A87			01				
A14-2A38/2C38	11	A09-2A38/2C38	11	6	A03A88			01				
A14-2A40/2C40	11	A09-2A40/2C40	11	6	A03A90			01				
A14-2A41/2C41	11	A09-2A41/2C41	11	6	A03A91			01				
A14-2A42/2C42	11	A09-2A42/2C42	11	6	A03A92			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A14-2A43/2C43	11	A09-2A43/2C43	11	6	A03A93			01								
A14-2B11/2D11	11	A21-1B37/1D37	11	8	A21B37			01								
A14-2B15/2D15	22	A17-2B30/2D30	22	6	A18B80			01								
A14-2B16/2D16	22	A17-2B31/2D31	22	6	A18B81			01								
A14-2B17/2D17	11	A18-2B32/2D32	11	6	A18B82			01								
A14-2B18/2D18	22	A16-2B33/2D33	22	5	A18B83			01								
A14-2B19/2D19	22	A16-2B34/2D34	22	5	A18B84			01								
A14-2B20*2D20	11	A17-2B35/2D35	11	6	A17B85			01								
A14-2B21*2D21	11	A17-2B36/2D36	11	6	A17B86			01								
A14-2B22*2D22	11	A17-2B37/2D37	11	6	A17B87			01								
A14-2B24*2D24	11	A17-2B38/2D38	11	6	A17B88			01								
A14-2B25*2D25	11	A17-2B40/2D40	11	6	A17B90			01								
A14-2B26*2D26	11	A17-2B41/2D41	11	6	A17B91			01								
A14-2B27*2D27	11	A17-2B42/2D42	11	6	A17B92			01								
A14-2B28*2D28	11	A17-2B43/2D43	11	6	A17B93			01								
A14-2B30/2D30	11	A06-2B30/2D30	11	7	A04B80			01								
A14-2B31/2D31	22	A12-2B31/2D31	22	5	A04B81			01								
A14-2B32/2D32	22	A06-2B32/2D32	22	7	A04B82			01								
A14-2B33/2D33	11	A11-2B33/2D33	11	5	A04B83			01								
A14-2B34/2D34	11	A11-2B34/2D34	11	5	A04B84			01								
A14-2B35/2D35	11	A09-2B35/2D35	11	6	A03B85			01								
A14-2B36/2D36	11	A09-2B36/2D36	11	6	A03B86			01								
A14-2B37/2D37	11	A09-2B37/2D37	11	6	A03B87			01								
A14-2B38/2D38	11	A09-2B38/2D38	11	6	A03B88			01								
A14-2B40/2D40	11	A09-2B40/2D40	11	6	A03B90			01								
A14-2B41/2D41	11	A09-2B41/2D41	11	6	A03B91			01								
A14-2B42/2D42	11	A09-2B42/2D42	11	6	A03B92			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A14-2B43/2D43	11	A09-2B43/2D43	11	6	A03B93			01				
A15-1A03/1C03	11	A18-2B03/2D03	11	8	A18B53			01				
A15-1A04/1C04	11	A17-1B04/1D04	11	5	A18B72			01				
A15-1A07/1C07	11	A18-1A04/1C04	11	13	A18A04			01				
A15-1A08/1C08	11	A24-1A08/1C08	11	8	A24A08			01				
A15-1A09/1C09	11	A24-1A12/1C12	11	8	A24A12			01				
A15-1A10/1C10	11	A24-1A10/1C10	11	8	A24A10			01				
A15-1A14/1C14	11	A18-2A08/2C08	11	8	A15A14			01				
A15-1A19/1C19	11	A18-2B17/2D17	11	8	A18B67			01				
A15-1A20/1C20	11	A18-1A36/1C36	11	6	A15A20			01				
A15-1A22/1C22	11	A18-1A33/1C33	11	6	A18A33			01				
A15-1A29/1C29	11	A18-2A05/2C05	11	6	A15A29			01				
A15-1A35/1C35	11	A18-1A34/1C34	11	5	A16A74			01				
A15-1A37/1C37	11	A16-1A37/1C37	11	4	A15A37			01				
A15-1A38/1C38	11	A16-1A38/1C38	11	4	A15A38			01				
A15-1A40/1C40	11	A16-1A40/1C40	11	4	A15A40			01				
A15-1A41/1C41	11	A16-1A41/1C41	11	4	A15A41			01				
A15-1A42/1C42	11	A16-1A42/1C42	11	4	A15A42			01				
A15-1A43/1C43	11	A16-1A43/1C43	11	4	A15A43			01				
A15-1B03/1D03	11	A18-1B43/1D43	11	7	A15B03			01				
A15-1B04/1D04	11	A18-1A41/1C41	11	7	A15B04			01				
A15-1B14/1D14	11	A18-2A07/2C07	11	8	A15B14			01				
A15-1B15/1D15	11	A16-2A42/2C42	11	11	A15B15			01				
A15-1B19/1D19	11	A16-2B30/2D30	11	9	A15B19			01				
A15-1B22/1D22	11	A18-2B16/2D16	11	8	A18B66			01				
A15-1B29/1D29	11	A16-2A41/2C41	11	9	A15B29			01				
A15-1B30/1D30	11	A16-2B32/2D32	11	8	A15B30			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A15-1B37/1D37	11	A16-1B37/1D37	11	4	A15B37			01						
A15-1B38/1D38	11	A16-1B38/1D38	11	4	A15B38			01						
A15-1B40/1D40	11	A16-1B40/1D40	11	4	A15B40			01						
A15-1B41/1D41	11	A16-1B41/1D41	11	4	A15B41			01						
A15-1B42/1D42	11	A16-1B42/1D42	11	4	A15B42			01						
A15-1B43/1D43	11	A16-1B43/1D43	11	4	A15B43			01						
A15-2A04/2C04	11	A18-2B10/2D10	11	6	A18B60			01						
A15-2A09/2C09	11	A18-2A27/2C27	11	6	A15A59			01						
A15-2A15/----		A15-2C15/----			GRNDXX			01						
A15-2A19/----		A15-2C19/----			GRNDXX			01						
A15-2A27/----		A15-2C27/----			GRNDXX			01						
A15-2A31/----		A15-2C31/----			GRNDXX			01						
A15-2A35/----		A15-2C35/----			GRNDXX			01						
A15-2A43/----		A15-2C43/----			GRNDXX			01						
A15-2B04/2D04	11	A16-2A36/2C36	11	6	A15B54			01						
A15-2B09/2D09	11	A16-2A38/2C38	11	6	A18A74			01						
A15-2B10/2D10	11	A18-2B25/2D25	11	6	A18B75			01						
A15-2B13/2D13	11	A18-2A21/2C21	11	5	A15B63			01						
A15-2B14/2D14	11	A24-1A11/1C11	11	10	A24A11			01						
A15-2B15/----		A15-2D15/----			GRNDXX			01						
A15-2B19/----		A15-2D19/----			GRNDXX			01						
A15-2B27/----		A15-2D27/----			GRNDXX			01						
A15-2B31/----		A15-2D31/----			GRNDXX			01						
A15-2B35/----		A15-2D35/----			GRNDXX			01						
A15-2B43/----		A15-2D43/----			GRNDXX			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A16-1A03/1C03	11	A18-1A03/1C03	11	13	A18A03			01							
A16-1A04/1C04	11	A18-2B09/2D09	11	13	A18B59			01							
A16-1A05/1C05	11	A18-1A05/1C05	11	13	A18A05			01							
A16-1A08/1C08	11	A18-1A08/1C08	11	5	A18A08			01							
A16-1A08/1C08	22	A14-1A29/1C29	22	6	A18A08			01							
A16-1A09/1C09	11	A18-1A09/1C09	11	5	A18A09			01							
A16-1A09/1C09	22	A14-1A30/1C30	22	6	A18A09			01							
A16-1A10/1C10	11	A18-1A10/1C10	11	5	A18A10			01							
A16-1A10/1C10	22	A14-1A31/1C31	22	6	A18A10			01							
A16-1A11/1C11	11	A18-1A11/1C11	11	5	A18A11			01							
A16-1A11/1C11	22	A14-1A32/1C32	22	6	A18A11			01							
A16-1A12/1C12	11	A18-1A12/1C12	11	5	A18A12			01							
A16-1A12/1C12	22	A14-1A33/1C33	22	6	A18A12			01							
A16-1A13/1C13	11	A18-1A13/1C13	11	5	A18A13			01							
A16-1A13/1C13	22	A14-1A34/1C34	22	6	A18A13			01							
A16-1A14/1C14	11	A18-1A14/1C14	11	5	A18A14			01							
A16-1A14/1C14	22	A14-1A35/1C35	22	6	A18A14			01							
A16-1A15/1C15	11	A18-1A15/1C15	11	5	A18A15			01							
A16-1A15/1C15	22	A14-1A36/1C36	22	6	A18A15			01							
A16-1A16/1C16	11	A18-1A16/1C16	11	5	A18A16			01							
A16-1A16/1C16	22	A14-1A37/1C37	22	6	A18A16			01							
A16-1A19/1C19	11	A18-1B42/1D42	11	6	A16A19			01							
A16-1A20/1C20	11	A22-2A32/2C32	11	10	A22A82			01							
A16-1A21/1C21	11	A18-2A14/2C14	11	8	A18A64			01							
A16-1A24/1C24	11	A17-1A24/1C24	11	4	A17A24			01							
A16-1A25/1C25	11	A17-1A25/1C25	11	4	A17A25			01							
A16-1A26/1C26	11	A17-1A26/1C26	11	4	A17A26			01							
A16-1A27/1C27	11	A17-1A27/1C27	11	4	A17A27			01							
A16-1A28/1C28	11	A17-1A28/1C28	11	4	A17A28			01							
A16-1A29/1C29	11	A17-1A29/1C29	11	4	A17A29			01							
A16-1A30/1C30	11	A17-1A30/1C30	11	4	A17A30			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A16-2A34/2C34	22	A18-2A34/2C34	22	5	A18A84			01							
A16-2A36/2C36	11	A15-2B04/2D04	11	6	A15B54			01							
A16-2A37/2C37	11	A18-2A20/2C20	11	6	A18A70			01							
A16-2A38/2C38	11	A15-2B09/2D09	11	6	A18A74			01							
A16-2A38/2C38	22	A18-2A24/2C24	22	5	A18A74			01							
A16-2A40/2C40	11	A18-2A15/2C15	11	6	A18A65			01							
A16-2A41/2C41	11	A15-1B29/1D29	11	9	A15B29			01							
A16-2A41/2C41	22	A18-1B35/1D35	22	9	A15B29			01							
A16-2A42/2C42	11	A15-1B15/1D15	11	11	A15B15			01							
A16-2A43/2C43	11	A17-2A25/2C25	11	5	A17A75			01							
A16-2B04/2D04	11	A17-1B35/1D35	11	6	A17B35			01							
A16-2B07/2D07	11	A17-2B07/2D07	11	4	A17B57			01							
A16-2B08/2D08	11	A17-2B08/2D08	11	4	A17B58			01							
A16-2B09/2D09	11	A17-2B09/2D09	11	4	A17B59			01							
A16-2B10/2D10	11	A17-2B10/2D10	11	4	A17B60			01							
A16-2B11/2D11	11	A17-2B11/2D11	11	4	A17B61			01							
A16-2B12/2D12	11	A17-2B12/2D12	11	4	A17B62			01							
A16-2B13/2D13	11	A17-2B13/2D13	11	4	A17B63			01							
A16-2B14/2D14	11	A17-2B14/2D14	11	4	A17B64			01							
A16-2B15/2D15	11	A17-1A35/1C35	11	6	A17A35			01							
A16-2B16/2D16	11	A18-1B36/1D36	11	6	A16B66			01							
A16-2B17/2D17	11	A18-2B18/2D18	11	5	A18B68			01							
A16-2B18/2D18	11	A17-2A22/2C22	11	4	A17A72			01							
A16-2B19/2D19	11	A22-1B37/1D37	11	8	A22B37			01							
A16-2B27/2D27	11	A18-2A04/2C04	11	6	A16B77			01							
A16-2B28/2D28	11	A18-2B15/2D15	11	5	A22B54			01							
A16-2B29/2D29	11	A18-2B04/2D04	11	6	A16B79			01							
A16-2B30/2D30	11	A15-1B19/1D19	11	9	A15B19			01							

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	A16-2B31/2D31	11	A17-2B21/2D21	11	5	A17B71			01						
	A16-2B32/2D32	11	A15-1B30/1D30	11	8	A15B30			01						
	A16-2B32/2D32	22	A18-2B05/2D05	22	6	A15B30			01						
	A16-2B33/2D33	11	A18-2B33/2D33	11	5	A18B83			01						
	A16-2B33/2D33	22	A14-2B18/2D18	22	5	A18B83			01						
	A16-2B34/2D34	11	A18-2B34/2D34	11	5	A18B84			01						
	A16-2B34/2D34	22	A14-2B19/2D19	22	5	A18B84			01						
	A16-2B35/2D35	22	A18-2A05/2C05	22	6	A15A29			01						
	A16-2B37/2D37	22	A18-1B17/1D17	22	10	A17A83			01						
	A16-2B42/2D42	22	A18-1A36/1C36	22	9	A15A20			01						
	A16-2B43/2D43	11	A18-1A35/1C35	11	9	A16B93			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	QA	TYPE	----- DESCRIPTION -----	OSE
A16-1A31/1C31	11	A17-1A31/1C31	11	4	A17A31			01				
A16-1A35/1C35	11	A18-2B07/2D07	11	6	A18B57			01				
A16-1A37/1C37	11	A15-1A37/1C37	11	4	A15A37			01				
A16-1A38/1C38	11	A15-1A38/1C38	11	4	A15A38			01				
A16-1A40/1C40	11	A15-1A40/1C40	11	4	A15A40			01				
A16-1A41/1C41	11	A15-1A41/1C41	11	4	A15A41			01				
A16-1A42/1C42	11	A15-1A42/1C42	11	4	A15A42			01				
A16-1A43/1C43	11	A15-1A43/1C43	11	4	A15A43			01				
A16-1B03/1D03	11	A18-1B03/1D03	11	13	A18B03			01				
A16-1B04/1D04	11	A18-2B42/2D42	11	13	A16B04			01				
A16-1B08/1D08	11	A18-1B08/1D08	11	5	A18B08			01				
A16-1B08/1D08	22	A14-1B29*1D29	22	6	A18B08			01				
A16-1B09/1D09	11	A18-1B09/1D09	11	5	A18B09			01				
A16-1B09/1D09	22	A14-1B30/1D30	22	6	A18B09			01				
A16-1B10/1D10	11	A18-1B10/1D10	11	5	A18B10			01				
A16-1B10/1D10	22	A14-1B31/1D31	22	6	A18B10			01				
A16-1B11/1D11	11	A18-1B11/1D11	11	5	A18B11			01				
A16-1B11/1D11	22	A14-1B32/1D32	22	6	A18B11			01				
A16-1B12/1D12	11	A18-1B12/1D12	11	5	A18B12			01				
A16-1B12/1D12	22	A14-1B33/1D33	22	6	A18B12			01				
A16-1B13/1D13	11	A18-1B13/1D13	11	5	A18B13			01				
A16-1B13/1D13	22	A14-1B34/1D34	22	6	A18B13			01				
A16-1B14/1D14	11	A18-1B14/1D14	11	5	A18B14			01				
A16-1B14/1D14	22	A14-1B35/1D35	22	6	A18B14			01				
A16-1B15/1D15	11	A18-1B15/1D15	11	5	A18B15			01				
A16-1B15/1D15	22	A14-1B36/1D36	22	6	A18B15			01				
A16-1B16/1D16	11	A18-1B16/1D16	11	5	A18B16			01				
A16-1B16/1D16	22	A14-1B37/1D37	22	6	A18B16			01				
A16-1B24/1D24	11	A17-1B24/1D24	11	4	A17B24			01				
A16-1B25/1D25	11	A17-1B25/1D25	11	4	A17B25			01				
A16-1B26/1D26	11	A17-1B26/1D26	11	4	A17B26			01				
A16-1B27/1D27	11	A17-1B27/1D27	11	4	A17B27			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A16-1B28/1D28	11	A17-1B28/1D28	11	4	A17B28			01						
A16-1B29/1D29	11	A17-1B29/1D29	11	4	A17B29			01						
A16-1B30/1D30	11	A17-1B30/1D30	11	4	A17B30			01						
A16-1B31/1D31	11	A17-1B31/1D31	11	4	A17B31			01						
A16-1B36/1D36	11	A22-2A17/2C17	11	8	A16B36			01						
A16-1B36/1D36	22	A25-2B26/2D26	22	10	A16B36			01						
A16-1B37/1D37	11	A15-1B37/1D37	11	4	A15B37			01						
A16-1B38/1D38	11	A15-1B38/1D38	11	4	A15B38			01						
A16-1B40/1D40	11	A15-1B40/1D40	11	4	A15B40			01						
A16-1B41/1D41	11	A15-1B41/1D41	11	4	A15B41			01						
A16-1B42/1D42	11	A15-1B42/1D42	11	4	A15B42			01						
A16-1B43/1D43	11	A15-1B43/1D43	11	4	A15B43			01						
A16-2A03/2C03	11	A17-2B20/2D20	11	5	A17B70			01						
A16-2A07/2C07	11	A17-2A07/2C07	11	4	A17A57			01						
A16-2A08/2C08	11	A17-2A08/2C08	11	4	A17A58			01						
A16-2A09/2C09	11	A17-2A09/2C09	11	4	A17A59			01						
A16-2A10/2C10	11	A17-2A10/2C10	11	4	A17A60			01						
A16-2A11/2C11	11	A17-2A11/2C11	11	4	A17A61			01						
A16-2A12/2C12	11	A17-2A12/2C12	11	4	A17A62			01						
A16-2A13/2C13	11	A17-2A13/2C13	11	4	A17A63			01						
A16-2A14/2C14	11	A17-2A14/2C14	11	4	A17A64			01						
A16-2A20/2C20	11	A18-2A26/2C26	11	5	A16A70			01						
A16-2A21/2C21	11	A23-2B19/2D19	11	7	A23B69			01						
A16-2A22/2C22	11	A18-1A43/1C43	11	6	A18A43			01						
A16-2A24/2C24	22	A18-1A34/1C34	22	7	A16A74			01						
A16-2A25/2C25	11	A18-2A03/2C03	11	6	A18A53			01						
A16-2A26/2C26	11	A17-2B34/2D34	11	5	A17B84			01						
A16-2A34/2C34	11	A14-2A19/2C19	11	5	A18A84			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A17-1A12/1C12	11	A18-1A40/1C40	11	6	A18A40			01				
A17-1A13/1C13	11	A17-1B34/1D34	11	6	A17B34			01				
A17-1A24/1C24	11	A16-1A24/1C24	11	4	A17A24			01				
A17-1A24/1C24	22	A18-1A24/1C24	22	4	A17A24			01				
A17-1A25/1C25	11	A16-1A25/1C25	11	4	A17A25			01				
A17-1A25/1C25	22	A18-1A25/1C25	22	4	A17A25			01				
A17-1A26/1C26	11	A16-1A26/1C26	11	4	A17A26			01				
A17-1A26/1C26	22	A18-1A26/1C26	22	4	A17A26			01				
A17-1A27/1C27	11	A16-1A27/1C27	11	4	A17A27			01				
A17-1A27/1C27	22	A18-1A27/1C27	22	4	A17A27			01				
A17-1A28/1C28	11	A16-1A28/1C28	11	4	A17A28			01				
A17-1A28/1C28	22	A18-1A28/1C28	22	4	A17A28			01				
A17-1A29/1C29	11	A16-1A29/1C29	11	4	A17A29			01				
A17-1A29/1C29	22	A18-1A29/1C29	22	4	A17A29			01				
A17-1A30/1C30	11	A16-1A30/1C30	11	4	A17A30			01				
A17-1A30/1C30	22	A18-1A30/1C30	22	4	A17A30			01				
A17-1A31/1C31	11	A16-1A31/1C31	11	4	A17A31			01				
A17-1A31/1C31	22	A18-1A31/1C31	22	4	A17A31			01				
A17-1A32/1C32	11	A18-2B29/2D29	11	8	A18B79			01				
A17-1A34/1C34	11	A18-1B22/1D22	11	5	A17A34			01				
A17-1A35/1C35	11	A16-2B15/2D15	11	6	A17A35			01				
A17-1A43/1C43	11	A18-1B38/1D38	11	4	A17A43			01				
A17-1B03/1D03	11	A17-2B24/2D24	11	10	A17B74			01				
A17-1B04/1D04	11	A15-1A04/1C04	11	5	A18B72			01				
A17-1B04/1D04	22	A17-2A34/2C34	22	11	A18B72			01				
A17-1B24/1D24	11	A16-1B24/1D24	11	4	A17B24			01				
A17-1B24/1D24	22	A18-1B24/1D24	22	4	A17B24			01				
A17-1B25/1D25	11	A16-1B25/1D25	11	4	A17B25			01				
A17-1B25/1D25	22	A18-1B25/1D25	22	4	A17B25			01				
A17-1B26/1D26	11	A16-1B26/1D26	11	4	A17B26			01				
A17-1B26/1D26	22	A18-1B26/1D26	22	4	A17B26			01				
A17-1B27/1D27	11	A16-1B27/1D27	11	4	A17B27			01				
A17-1B27/1D27	22	A18-1B27/1D27	22	4	A17B27			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A17-1B28/1D28	11	A16-1B28/1D28	11	4	A17B28			01						
A17-1B28/1D28	22	A18-1B28/1D28	22	4	A17B28			01						
A17-1B29/1D29	11	A16-1B29/1D29	11	4	A17B29			01						
A17-1B29/1D29	22	A18-1B29/1D29	22	4	A17B29			01						
A17-1B30/1D30	11	A16-1B30/1D30	11	4	A17B30			01						
A17-1B30/1D30	22	A18-1B30/1D30	22	4	A17B30			01						
A17-1B31/1D31	11	A16-1B31/1D31	11	4	A17B31			01						
A17-1B31/1D31	22	A18-1B31/1D31	22	4	A17B31			01						
A17-1B33/1D33	11	A18-2A28/2C28	11	8	A17B33			01						
A17-1B34/1D34	11	A17-1A13/1C13	11	6	A17B34			01						
A17-1B35/1D35	11	A16-2B04/2D04	11	6	A17B35			01						
A17-2A03/2C03	11	A18-2A13/2C13	11	5	A18A63			01						
A17-2A05/2C05	11	A18-1A38/1C38	11	6	A17A55			01						
A17-2A07/2C07	11	A16-2A07/2C07	11	4	A17A57			01						
A17-2A08/2C08	11	A16-2A08/2C08	11	4	A17A58			01						
A17-2A09/2C09	11	A16-2A09/2C09	11	4	A17A59			01						
A17-2A10/2C10	11	A16-2A10/2C10	11	4	A17A60			01						
A17-2A11/2C11	11	A16-2A11/2C11	11	4	A17A61			01						
A17-2A12/2C12	11	A16-2A12/2C12	11	4	A17A62			01						
A17-2A13/2C13	11	A16-2A13/2C13	11	4	A17A63			01						
A17-2A14/2C14	11	A16-2A14/2C14	11	4	A17A64			01						
A17-2A17/2C17	11	A18-1A42/1C42	11	6	A18A42			01						
A17-2A20/2C20	11	A18-2A25/2C25	11	4	A17A70			01						
A17-2A21/2C21	11	A18-1B34/1D34	11	7	A17A71			01						
A17-2A22/2C22	11	A16-2B18/2D18	11	4	A17A72			01						
A17-2A25/2C25	11	A16-2A43/2C43	11	5	A17A75			01						
A17-2A26/2C26	11	A24-1A09/1C09	11	11	A24A09			01						
A17-2A27/2C27	11	A18-2A18/2C18	11	5	A17A77			01						
A17-2A30/2C30	11	A18-2A30/2C30	11	4	A18A80			01						

PAGE	73	PACK	A17 60000496 REV A										DATE 90/01/19		
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A17-2A30/2C30	22	A14-2A15/2C15	22	6	A18A80			01							
A17-2A31/2C31	11	A18-2A31/2C31	11	4	A18A81			01							
A17-2A31/2C31	22	A14-2A16/2C16	22	6	A18A81			01							
A17-2A32/2C32	11	A18-1B41/1D41	11	7	A18B41			01							
A17-2A33/2C33	11	A18-1B17/1D17	11	10	A17A83			01							
A17-2A34/2C34	11	A18-2B22/2D22	11	5	A18B72			01							
A17-2A34/2C34	22	A17-1B04/1D04	22	11	A18B72			01							
A17-2A35/2C35	11	A14-2A20*2C20	11	6	A17A85			01							
A17-2A35/2C35	22	A19-2A35/2C35	22	5	A17A85			01							
A17-2A36/2C36	11	A14-2A21*2C21	11	6	A17A86			01							
A17-2A36/2C36	22	A19-2A36/2C36	22	5	A17A86			01							
A17-2A37/2C37	11	A14-2A22*2C22	11	6	A17A87			01							
A17-2A37/2C37	22	A19-2A37/2C37	22	5	A17A87			01							
A17-2A38/2C38	11	A14-2A24*2C24	11	6	A17A88			01							
A17-2A38/2C38	22	A19-2A38/2C38	22	5	A17A88			01							
A17-2A40/2C40	11	A14-2A25*2C25	11	6	A17A90			01							
A17-2A40/2C40	22	A19-2A40/2C40	22	5	A17A90			01							
A17-2A41/2C41	11	A14-2A26*2C26	11	6	A17A91			01							
A17-2A41/2C41	22	A19-2A41/2C41	22	5	A17A91			01							
A17-2A42/2C42	11	A14-2A27*2C27	11	6	A17A92			01							
A17-2A42/2C42	22	A19-2A42/2C42	22	5	A17A92			01							
A17-2A43/2C43	11	A14-2A28*2C28	11	6	A17A93			01							
A17-2A43/2C43	22	A19-2A43/2C43	22	5	A17A93			01							
A17-2B07/2D07	11	A16-2B07/2D07	11	4	A17B57			01							
A17-2B08/2D08	11	A16-2B08/2D08	11	4	A17B58			01							
A17-2B09/2D09	11	A16-2B09/2D09	11	4	A17B59			01							
A17-2B10/2D10	11	A16-2B10/2D10	11	4	A17B60			01							
A17-2B11/2D11	11	A16-2B11/2D11	11	4	A17B61			01							
A17-2B12/2D12	11	A16-2B12/2D12	11	4	A17B62			01							
A17-2B13/2D13	11	A16-2B13/2D13	11	4	A17B63			01							
A17-2B14/2D14	11	A16-2B14/2D14	11	4	A17B64			01							
A17-2B20/2D20	11	A16-2A03/2C03	11	5	A17B70			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A17-2B21/2D21	11	A16-2B31/2D31	11	5	A17B71			01						
A17-2B22/2D22	11	A18-1A17/1C17	11	9	A17B72			01						
A17-2B24/2D24	11	A17-1B03/1D03	11	10	A17B74			01						
A17-2B25/2D25	11	A21-1B31/1D31	11	8	A17B75			01						
A17-2B26/2D26	11	A18-2B24/2D24	11	4	A17B76			01						
A17-2B27/2D27	11	A18-2A19/2C19	11	4	A17B77			01						
A17-2B30/2D30	11	A18-2B30/2D30	11	4	A18B80			01						
A17-2B30/2D30	22	A14-2B15/2D15	22	6	A18B80			01						
A17-2B31/2D31	11	A18-2B31/2D31	11	4	A18B81			01						
A17-2B31/2D31	22	A14-2B16/2D16	22	6	A18B81			01						
A17-2B33/2D33	11	A18-2B12/2D12	11	6	A17B83			01						
A17-2B34/2D34	11	A16-2A26/2C26	11	5	A17B84			01						
A17-2B34/2D34	22	A18-2A09/2C09	22	6	A17B84			01						
A17-2B35/2D35	11	A14-2B20*2D20	11	6	A17B85			01						
A17-2B35/2D35	22	A19-2B35/2D35	22	5	A17B85			01						
A17-2B36/2D36	11	A14-2B21*2D21	11	6	A17B86			01						
A17-2B36/2D36	22	A19-2B36/2D36	22	5	A17B86			01						
A17-2B37/2D37	11	A14-2B22*2D22	11	6	A17B87			01						
A17-2B37/2D37	22	A19-2B37/2D37	22	5	A17B87			01						
A17-2B38/2D38	11	A14-2B24*2D24	11	6	A17B88			01						
A17-2B38/2D38	22	A19-2B38/2D38	22	5	A17B88			01						
A17-2B40/2D40	11	A14-2B25*2D25	11	6	A17B90			01						
A17-2B40/2D40	22	A19-2B40/2D40	22	5	A17B90			01						
A17-2B41/2D41	11	A14-2B26*2D26	11	6	A17B91			01						
A17-2B41/2D41	22	A19-2B41/2D41	22	5	A17B91			01						
A17-2B42/2D42	11	A14-2B27*2D27	11	6	A17B92			01						
A17-2B42/2D42	22	A19-2B42/2D42	22	5	A17B92			01						
A17-2B43/2D43	11	A14-2B28*2D28	11	6	A17B93			01						
A17-2B43/2D43	22	A19-2B43/2D43	22	5	A17B93			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A18-1A03/1C03	11	A16-1A03/1C03	11	13	A18A03			01							
A18-1A04/1C04	11	A15-1A07/1C07	11	13	A18A04			01							
A18-1A05/1C05	11	A16-1A05/1C05	11	13	A18A05			01							
A18-1A07/1C07	11	A24-1A07/1C07	11	13	A18A07			01							
A18-1A08/1C08	11	A16-1A08/1C08	11	5	A18A08			01							
A18-1A08/1C08	22	A19-1A08/1C08	22	4	A18A08			01							
A18-1A09/1C09	11	A16-1A09/1C09	11	5	A18A09			01							
A18-1A09/1C09	22	A19-1A09/1C09	22	4	A18A09			01							
A18-1A10/1C10	11	A16-1A10/1C10	11	5	A18A10			01							
A18-1A10/1C10	22	A19-1A10/1C10	22	4	A18A10			01							
A18-1A11/1C11	11	A16-1A11/1C11	11	5	A18A11			01							
A18-1A11/1C11	22	A19-1A11/1C11	22	4	A18A11			01							
A18-1A12/1C12	11	A16-1A12/1C12	11	5	A18A12			01							
A18-1A12/1C12	22	A19-1A12/1C12	22	4	A18A12			01							
A18-1A13/1C13	11	A16-1A13/1C13	11	5	A18A13			01							
A18-1A13/1C13	22	A19-1A13/1C13	22	4	A18A13			01							
A18-1A14/1C14	11	A16-1A14/1C14	11	5	A18A14			01							
A18-1A14/1C14	22	A19-1A14/1C14	22	4	A18A14			01							
A18-1A15/1C15	11	A16-1A15/1C15	11	5	A18A15			01							
A18-1A15/1C15	22	A19-1A15/1C15	22	4	A18A15			01							
A18-1A16/1C16	11	A16-1A16/1C16	11	5	A18A16			01							
A18-1A16/1C16	22	A19-1A16/1C16	22	4	A18A16			01							
A18-1A17/1C17	11	A17-2B22/2D22	11	9	A17B72			01							
A18-1A22/1C22	22	A23-2B19/2D19	22	9	A23B69			01							
A18-1A24/1C24	22	A17-1A24/1C24	22	4	A17A24			01							
A18-1A25/1C25	22	A17-1A25/1C25	22	4	A17A25			01							
A18-1A26/1C26	22	A17-1A26/1C26	22	4	A17A26			01							
A18-1A27/1C27	22	A17-1A27/1C27	22	4	A17A27			01							
A18-1A28/1C28	22	A17-1A28/1C28	22	4	A17A28			01							
A18-1A29/1C29	22	A17-1A29/1C29	22	4	A17A29			01							
A18-1A30/1C30	22	A17-1A30/1C30	22	4	A17A30			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A18-1A31/1C31	22	A17-1A31/1C31	22	4	A17A31			01								
A18-1A32/1C32	11	A25-1B04/1D04	11	13	A18A32			01								
A18-1A33/1C33	11	A15-1A22/1C22	11	6	A18A33			01								
A18-1A34/1C34	11	A15-1A35/1C35	11	5	A16A74			01								
A18-1A34/1C34	22	A16-2A24/2C24	22	7	A16A74			01								
A18-1A35/1C35	11	A16-2B43/2D43	11	9	A16B93			01								
A18-1A36/1C36	11	A15-1A20/1C20	11	6	A15A20			01								
A18-1A36/1C36	22	A16-2B42/2D42	22	9	A15A20			01								
A18-1A37/1C37	11	A24-1B05/1D05	11	13	A18A37			01								
A18-1A38/1C38	11	A17-2A05/2C05	11	6	A17A55			01								
A18-1A40/1C40	11	A17-1A12/1C12	11	6	A18A40			01								
A18-1A41/1C41	11	A15-1B04/1D04	11	7	A15B04			01								
A18-1A42/1C42	11	A17-2A17/2C17	11	6	A18A42			01								
A18-1A43/1C43	11	A16-2A22/2C22	11	6	A18A43			01								
A18-1B03/1D03	11	A16-1B03/1D03	11	13	A18B03			01								
A18-1B04/1D04	11	A20-1B04/1D04	11	13	A18B04			01								
A18-1B05/1D05	11	A21-1B05/1D05	11	13	A18B05			01								
A18-1B08/1D08	11	A16-1B08/1D08	11	5	A18B08			01								
A18-1B08/1D08	22	A19-1B08/1D08	22	4	A18B08			01								
A18-1B09/1D09	11	A16-1B09/1D09	11	5	A18B09			01								
A18-1B09/1D09	22	A19-1B09/1D09	22	4	A18B09			01								
A18-1B10/1D10	11	A16-1B10/1D10	11	5	A18B10			01								
A18-1B10/1D10	22	A19-1B10/1D10	22	4	A18B10			01								
A18-1B11/1D11	11	A16-1B11/1D11	11	5	A18B11			01								
A18-1B11/1D11	22	A19-1B11/1D11	22	4	A18B11			01								
A18-1B12/1D12	11	A16-1B12/1D12	11	5	A18B12			01								
A18-1B12/1D12	22	A19-1B12/1D12	22	4	A18B12			01								
A18-1B13/1D13	11	A16-1B13/1D13	11	5	A18B13			01								
A18-1B13/1D13	22	A19-1B13/1D13	22	4	A18B13			01								
A18-1B14/1D14	11	A16-1B14/1D14	11	5	A18B14			01								
A18-1B14/1D14	22	A19-1B14/1D14	22	4	A18B14			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A18-1B15/1D15	11	A16-1B15/1D15	11	5	A18B15			01				
A18-1B15/1D15	22	A19-1B15/1D15	22	4	A18B15			01				
A18-1B16/1D16	11	A16-1B16/1D16	11	5	A18B16			01				
A18-1B16/1D16	22	A19-1B16/1D16	22	4	A18B16			01				
A18-1B17/1D17	11	A17-2A33/2C33	11	10	A17A83			01				
A18-1B17/1D17	22	A16-2B37/2D37	22	10	A17A83			01				
A18-1B22/1D22	11	A17-1A34/1C34	11	5	A17A34			01				
A18-1B24/1D24	22	A17-1B24/1D24	22	4	A17B24			01				
A18-1B25/1D25	22	A17-1B25/1D25	22	4	A17B25			01				
A18-1B26/1D26	22	A17-1B26/1D26	22	4	A17B26			01				
A18-1B27/1D27	22	A17-1B27/1D27	22	4	A17B27			01				
A18-1B28/1D28	22	A17-1B28/1D28	22	4	A17B28			01				
A18-1B29/1D29	22	A17-1B29/1D29	22	4	A17B29			01				
A18-1B30/1D30	22	A17-1B30/1D30	22	4	A17B30			01				
A18-1B31/1D31	22	A17-1B31/1D31	22	4	A17B31			01				
A18-1B32/1D32	11	A24-2B26/2D26	11	9	A18B32			01				
A18-1B33/1D33	11	A14-1B21/1D21	11	6	A18B33			01				
A18-1B34/1D34	11	A17-2A21/2C21	11	7	A17A71			01				
A18-1B35/1D35	22	A16-2A41/2C41	22	9	A15B29			01				
A18-1B36/1D36	11	A16-2B16/2D16	11	6	A16B66			01				
A18-1B37/1D37	11	A21-1A07/1C07	11	13	A18A07			01				
A18-1B38/1D38	11	A17-1A43/1C43	11	4	A17A43			01				
A18-1B40/1D40	11	A21-1A34/1C34	11	5	A21A34			01				
A18-1B41/1D41	11	A17-2A32/2C32	11	7	A18B41			01				
A18-1B42/1D42	11	A16-1A19/1C19	11	6	A16A19			01				
A18-1B43/1D43	11	A15-1B03/1D03	11	7	A15B03			01				
A18-2A03/2C03	11	A16-2A25/2C25	11	6	A18A53			01				
A18-2A04/2C04	11	A16-2B27/2D27	11	6	A16B77			01				
A18-2A05/2C05	11	A15-1A29/1C29	11	6	A15A29			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A18-2A05/2C05	22	A16-2B35/2D35	22	6	A15A29			01								
A18-2A07/2C07	11	A15-1B14/1D14	11	8	A15B14			01								
A18-2A08/2C08	11	A15-1A14/1C14	11	8	A15A14			01								
A18-2A09/2C09	11	A22-2B16/2D16	11	6	A17B84			01								
A18-2A09/2C09	22	A17-2B34/2D34	22	6	A17B84			01								
A18-2A10/2C10	11	A20-1A04/1C04	11	13	A18A60			01								
A18-2A11/2C11	11	A22-1A04/1C04	11	13	A18A61			01								
A18-2A12/2C12	11	A14-1A21/1C21	11	13	A18A62			01								
A18-2A13/2C13	11	A17-2A03/2C03	11	5	A18A63			01								
A18-2A14/2C14	11	A16-1A21/1C21	11	8	A18A64			01								
A18-2A15/2C15	11	A16-2A40/2C40	11	6	A18A65			01								
A18-2A16/2C16	11	A22-1B03/1D03	11	13	A18A66			01								
A18-2A17/2C17	11	A20-2B14/2D14	11	5	A20B64			01								
A18-2A18/2C18	11	A17-2A27/2C27	11	5	A17A77			01								
A18-2A19/2C19	11	A17-2B27/2D27	11	4	A17B77			01								
A18-2A20/2C20	11	A16-2A37/2C37	11	6	A18A70			01								
A18-2A21/2C21	11	A15-2B13/2D13	11	5	A15B63			01								
A18-2A22/2C22	11	A21-1A38/1C38	11	7	A21A38			01								
A18-2A24/2C24	22	A16-2A38/2C38	22	5	A18A74			01								
A18-2A25/2C25	11	A17-2A20/2C20	11	4	A17A70			01								
A18-2A26/2C26	11	A16-2A20/2C20	11	5	A16A70			01								
A18-2A27/2C27	11	A15-2A09/2C09	11	6	A15A59			01								
A18-2A28/2C28	11	A17-1B33/1D33	11	8	A17B33			01								
A18-2A29/2C29	11	A22-1B05/1D05	11	13	A18A79			01								
A18-2A30/2C30	11	A17-2A30/2C30	11	4	A18A80			01								
A18-2A30/2C30	22	A20-2A30/2C30	22	5	A18A80			01								
A18-2A31/2C31	11	A17-2A31/2C31	11	4	A18A81			01								
A18-2A31/2C31	22	A20-2A31/2C31	22	5	A18A81			01								
A18-2A32/2C32	11	A20-1A05/1C05	11	13	A18A82			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A18-2A33/2C33	11	A25-1A05/1C05	11	13	A18A83			01								
A18-2A34/2C34	11	A19-2A34/2C34	11	4	A18A84			01								
A18-2A34/2C34	22	A16-2A34/2C34	22	5	A18A84			01								
A18-2B03/2D03	11	A15-1A03/1C03	11	8	A18B53			01								
A18-2B04/2D04	11	A16-2B29/2D29	11	5	A18B79			01								
A18-2B05/2D05	22	A16-2B32/2D32	22	6	A18B30			01								
A18-2B07/2D07	11	A16-1A35/1C35	11	6	A18B57			01								
A18-2B08/2D08	11	A22-1B35/1D35	11	6	A22B35			01								
A18-2B09/2D09	11	A16-1A04/1C04	11	13	A18B59			01								
A18-2B10/2D10	11	A15-2A04/2C04	11	6	A18B60			01								
A18-2B11/2D11	11	A25-1A04/1C04	11	13	A18B61			01								
A18-2B12/2D12	11	A17-2B33/2D33	11	6	A17B83			01								
A18-2B13/2D13	11	A20-1B03/1D03	11	13	A18B63			01								
A18-2B14/2D14	11	A21-1B03/1D03	11	13	A18B64			01								
A18-2B15/2D15	11	A16-2B28/2D28	11	5	A22B54			01								
A18-2B15/2D15	22	A22-2B04/2D04	22	6	A22B54			01								
A18-2B16/2D16	11	A15-1B22/1D22	11	8	A18B66			01								
A18-2B17/2D17	11	A15-1A19/1C19	11	8	A18B67			01								
A18-2B18/2D18	11	A16-2B17/2D17	11	5	A18B68			01								
A18-2B19/2D19	11	A25-1B03/1D03	11	13	A18B69			01								
A18-2B20/2D20	11	A14-1B20/1D20	11	13	A18B70			01								
A18-2B24/2D24	11	A20-1A03/1C03	11	13	A18B71			01								
A18-2B22/2D22	11	A17-2A34/2C34	11	5	A18B72			01								
A18-2B24/2D24	11	A17-2B28/2D28	11	4	A17B76			01								
A18-2B25/2D25	11	A15-2B10/2D10	11	6	A18B75			01								
A18-2B26/2D26	11	A22-1A03/1C03	11	13	A18B76			01								
A18-2B27/2D27	11	A25-1A03/1C03	11	13	A18B77			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A18-2B28/2D28	11	A14-1A20/1C20	11	13	A18B78			01				
A18-2B29/2D29	11	A17-1A32/1C32	11	8	A18B79			01				
A18-2B30/2D30	11	A17-2B30/2D30	11	4	A18B80			01				
A18-2B30/2D30	22	A20-2B30/2D30	22	5	A18B80			01				
A18-2B31/2D31	11	A17-2B31/2D31	11	4	A18B81			01				
A18-2B31/2D31	22	A20-2B31/2D31	22	5	A18B81			01				
A18-2B32/2D32	11	A14-2B17/2D17	11	6	A18B82			01				
A18-2B32/2D32	22	A20-2B32/2D32	22	5	A18B82			01				
A18-2B33/2D33	11	A16-2B33/2D33	11	5	A18B83			01				
A18-2B33/2D33	22	A19-2B33/2D33	22	4	A18B83			01				
A18-2B34/2D34	11	A16-2B34/2D34	11	5	A18B84			01				
A18-2B34/2D34	22	A19-2B34/2D34	22	4	A18B84			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A19-1A07/1C07	11	A20-1B10/1D10	11	4	A20B10							01
A19-1A08/1C08	11	A21-1A08/1C08	11	5	A18A08							01
A19-1A08/1C08	22	A18-1A08/1C08	22	4	A18A08							01
A19-1A09/1C09	11	A21-1A09/1C09	11	5	A18A09							01
A19-1A09/1C09	22	A18-1A09/1C09	22	4	A18A09							01
A19-1A10/1C10	11	A21-1A10/1C10	11	5	A18A10							01
A19-1A10/1C10	22	A18-1A10/1C10	22	4	A18A10							01
A19-1A11/1C11	11	A21-1A11/1C11	11	5	A18A11							01
A19-1A11/1C11	22	A18-1A11/1C11	22	4	A18A11							01
A19-1A12/1C12	11	A21-1A12/1C12	11	5	A18A12							01
A19-1A12/1C12	22	A18-1A12/1C12	22	4	A18A12							01
A19-1A13/1C13	11	A21-1A13/1C13	11	5	A18A13							01
A19-1A13/1C13	22	A18-1A13/1C13	22	4	A18A13							01
A19-1A14/1C14	11	A21-1A14/1C14	11	5	A18A14							01
A19-1A14/1C14	22	A18-1A14/1C14	22	4	A18A14							01
A19-1A15/1C15	11	A21-1A15/1C15	11	5	A18A15							01
A19-1A15/1C15	22	A18-1A15/1C15	22	4	A18A15							01
A19-1A16/1C16	11	A21-1A16/1C16	11	5	A18A16							01
A19-1A16/1C16	22	A18-1A16/1C16	22	4	A18A16							01
A19-1A17/1C17	11	A20-1A17/1C17	11	4	A20A17							01
A19-1A18/1C18	11	A20-1A18/1C18	11	4	A20A18							01
A19-1A19/1C19	11	A20-1A19/1C19	11	4	A20A19							01
A19-1A20/1C20	11	A20-1A20/1C20	11	4	A19A20							01
A19-1A21/1C21	11	A20-1A21/1C21	11	4	A20A21							01
A19-1A22/1C22	11	A20-1A22/1C22	11	4	A20A22							01
A19-1A24/1C24	11	A20-1A24/1C24	11	4	A20A24							01
A19-1A25/1C25	11	A20-1A25/1C25	11	4	A20A25							01
A19-1A26/1C26	11	A20-1A26/1C26	11	4	A20A26							01
A19-1A27/1C27	11	A20-1A27/1C27	11	4	A20A27							01
A19-1A28/1C28	11	A20-1A28/1C28	11	4	A20A28							01
A19-1A29/1C29	11	A20-1A29/1C29	11	4	A20A29							01

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A19-1A30/1C30	11	A20-1A30/1C30	11	4	A19A30			01								
A19-1A31/1C31	11	A20-1A31/1C31	11	4	A19A31			01								
A19-1A32/1C32	11	A20-1A32/1C32	11	4	A19A32			01								
A19-1A33/1C33	11	A20-1A33/1C33	11	4	A19A33			01								
A19-1A34/1C34	11	A20-1A34/1C34	11	4	A19A34			01								
A19-1A35/1C35	11	A20-1A35/1C35	11	4	A19A35			01								
A19-1A36/1C36	11	A20-1A36/1C36	11	4	A19A36			01								
A19-1A37/1C37	11	A20-1A37/1C37	11	4	A19A37			01								
A19-1A38/1C38	11	A20-1A38/1C38	11	4	A19A38			01								
A19-1A40/1C40	11	A20-1A40/1C40	11	4	A20A40			01								
A19-1A41/1C41	11	A20-1A41/1C41	11	4	A20A41			01								
A19-1A42/1C42	11	A20-1A42/1C42	11	4	A19A42			01								
A19-1A43/1C43	11	A20-1A43/1C43	11	4	A20A43			01								
A19-1B08/1D08	11	A21-1B08/1D08	11	5	A18B08			01								
A19-1B08/1D08	22	A18-1B08/1D08	22	4	A18B08			01								
A19-1B09/1D09	11	A21-1B09/1D09	11	5	A18B09			01								
A19-1B09/1D09	22	A18-1B09/1D09	22	4	A18B09			01								
A19-1B10/1D10	11	A21-1B10/1D10	11	5	A18B10			01								
A19-1B10/1D10	22	A18-1B10/1D10	22	4	A18B10			01								
A19-1B11/1D11	11	A21-1B11/1D11	11	5	A18B11			01								
A19-1B11/1D11	22	A18-1B11/1D11	22	4	A18B11			01								
A19-1B12/1D12	11	A21-1B12/1D12	11	5	A18B12			01								
A19-1B12/1D12	22	A18-1B12/1D12	22	4	A18B12			01								
A19-1B13/1D13	11	A21-1B13/1D13	11	5	A18B13			01								
A19-1B13/1D13	22	A18-1B13/1D13	22	4	A18B13			01								
A19-1B14/1D14	11	A21-1B14/1D14	11	5	A18B14			01								
A19-1B14/1D14	22	A18-1B14/1D14	22	4	A18B14			01								
A19-1B15/1D15	11	A21-1B15/1D15	11	5	A18B15			01								
A19-1B15/1D15	22	A18-1B15/1D15	22	4	A18B15			01								
A19-1B16/1D16	11	A21-1B16/1D16	11	5	A18B16			01								
A19-1B16/1D16	22	A18-1B16/1D16	22	4	A18B16			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A19-1B17/1D17	11	A20-1B17/1D17	11	4	A20B17			01				
A19-1B18/1D18	11	A20-1B18/1D18	11	4	A20B18			01				
A19-1B19/1D19	11	A20-1B19/1D19	11	4	A20B19			01				
A19-1B20/1D20	11	A20-1B20/1D20	11	4	A19B20			01				
A19-1B21/1D21	11	A20-1B21/1D21	11	4	A19B21			01				
A19-1B22/1D22	11	A20-1B22/1D22	11	4	A20B22			01				
A19-1B24/1D24	11	A20-1B24/1D24	11	4	A20B24			01				
A19-1B25/1D25	11	A20-1B25/1D25	11	4	A20B25			01				
A19-1B26/1D26	11	A20-1B26/1D26	11	4	A20B26			01				
A19-1B27/1D27	11	A20-1B27/1D27	11	4	A20B27			01				
A19-1B28/1D28	11	A20-1B28/1D28	11	4	A20B28			01				
A19-1B29/1D29	11	A20-1B29/1D29	11	4	A20B29			01				
A19-1B30/1D30	11	A20-1B30/1D30	11	4	A19B30			01				
A19-1B31/1D31	11	A20-1B31/1D31	11	4	A19B31			01				
A19-1B32/1D32	11	A20-1B32/1D32	11	4	A19B32			01				
A19-1B33/1D33	11	A20-1B33/1D33	11	4	A19B33			01				
A19-1B34/1D34	11	A20-1B34/1D34	11	4	A19B34			01				
A19-1B35/1D35	11	A20-1B35/1D35	11	4	A19B35			01				
A19-1B36/1D36	11	A20-1B36/1D36	11	4	A19B36			01				
A19-1B37/1D37	11	A20-1B37/1D37	11	4	A19B37			01				
A19-1B38/1D38	11	A20-1B38/1D38	11	4	A19B38			01				
A19-1B40/1D40	11	A20-1B40/1D40	11	4	A20B40			01				
A19-1B41/1D41	11	A20-1B41/1D41	11	4	A20B41			01				
A19-1B42/1D42	11	A20-1B42/1D42	11	4	A19B42			01				
A19-1B43/1D43	11	A20-1B43/1D43	11	4	A20B43			01				
A19-2A03/2C03	11	A20-2A03/2C03	11	4	A20A53			01				
A19-2A04/2C04	11	A20-2A04/2C04	11	4	A20A54			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A19-2A05/2C05	11	A20-2A05/2C05	11	4	A20A55			01							
A19-2A07/2C07	11	A20-2A07/2C07	11	4	A20A57			01							
A19-2A08/2C08	11	A20-2A08/2C08	11	4	A20A58			01							
A19-2A09/2C09	11	A20-2A09/2C09	11	4	A19A59			01							
A19-2A10/2C10	11	A20-2A10/2C10	11	4	A20A60			01							
A19-2A11/2C11	11	A20-2A11/2C11	11	4	A20A61			01							
A19-2A12/2C12	11	A20-2A12/2C12	11	4	A19A62			01							
A19-2A13/2C13	11	A19-2B13/2D13	11	4	A22B38			01							
A19-2A14/2C14	11	A19-2B14/2D14	11	4	A22B38			01							
A19-2A14/2C14	22	A19-2B13/2D13	22	4	A22B38			01							
A19-2A15/2C15	11	A19-2B15/2D15	11	4	A22B38			01							
A19-2A15/2C15	22	A19-2B14/2D14	22	4	A22B38			01							
A19-2A16/2C16	11	A19-2B16/2D16	11	4	A22B38			01							
A19-2A16/2C16	22	A19-2B15/2D15	22	4	A22B38			01							
A19-2A17/2C17	11	A19-2B17/2D17	11	4	A22B38			01							
A19-2A17/2C17	22	A19-2B16/2D16	22	4	A22B38			01							
A19-2A18/2C18	11	A19-2B18/2D18	11	4	A22B38			01							
A19-2A18/2C18	22	A19-2B17/2D17	22	4	A22B38			01							
A19-2A19/2C19	11	A19-2B19/2D19	11	4	A22B38			01							
A19-2A19/2C19	22	A19-2B18/2D18	22	4	A22B38			01							
A19-2A20/2C20	11	A19-2B20/2D20	11	4	A22B38			01							
A19-2A20/2C20	22	A19-2B19/2D19	22	4	A22B38			01							
A19-2A21/2C21	11	A20-2A21/2C21	11	4	A20A71			01							
A19-2A22/2C22	11	A20-2A22/2C22	11	4	A20A72			01							
A19-2A24/2C24	11	A20-2A24/2C24	11	4	A20A74			01							
A19-2A25/2C25	11	A14-1B41/1D41	11	7	A19A75			01							
A19-2A26/2C26	11	A14-1B40/1D40	11	8	A19A76			01							
A19-2A27/2C27	11	A20-2A27/2C27	11	4	A20A77			01							
A19-2A28/2C28	11	A20-2A28/2C28	11	4	A20A78			01							
A19-2A33/2C33	11	A20-1A10/1C10	11	10	A20A10			01							
A19-2A34/2C34	11	A18-2A34/2C34	11	4	A18A84			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A19-2A34/2C34	22	A21-2A34/2C34	22	5	A18A84			01							
A19-2A35/2C35	11	A21-2A35/2C35	11	5	A17A85			01							
A19-2A35/2C35	22	A17-2A35/2C35	22	5	A17A85			01							
A19-2A36/2C36	11	A21-2A36/2C36	11	5	A17A86			01							
A19-2A36/2C36	22	A17-2A36/2C36	22	5	A17A86			01							
A19-2A37/2C37	11	A21-2A37/2C37	11	5	A17A87			01							
A19-2A37/2C37	22	A17-2A37/2C37	22	5	A17A87			01							
A19-2A38/2C38	11	A21-2A38/2C38	11	5	A17A88			01							
A19-2A38/2C38	22	A17-2A38/2C38	22	5	A17A88			01							
A19-2A40/2C40	11	A21-2A40/2C40	11	5	A17A90			01							
A19-2A40/2C40	22	A17-2A40/2C40	22	5	A17A90			01							
A19-2A41/2C41	11	A21-2A41/2C41	11	5	A17A91			01							
A19-2A41/2C41	22	A17-2A41/2C41	22	5	A17A91			01							
A19-2A42/2C42	11	A21-2A42/2C42	11	5	A17A92			01							
A19-2A42/2C42	22	A17-2A42/2C42	22	5	A17A92			01							
A19-2A43/2C43	11	A21-2A43/2C43	11	5	A17A93			01							
A19-2A43/2C43	22	A17-2A43/2C43	22	5	A17A93			01							
A19-2B03/2D03	11	A20-2B03/2D03	11	4	A20B53			01							
A19-2B04/2D04	11	A20-2B04/2D04	11	4	A20B54			01							
A19-2B05/2D05	11	A20-2B05/2D05	11	4	A20B55			01							
A19-2B07/2D07	11	A20-2B07/2D07	11	4	A20B57			01							
A19-2B08/2D08	11	A20-2B08/2D08	11	4	A20B58			01							
A19-2B09/2D09	11	A20-2B09/2D09	11	4	A19B59			01							
A19-2B10/2D10	11	A20-2B10/2D10	11	4	A20B60			01							
A19-2B11/2D11	11	A20-2B11/2D11	11	4	A20B61			01							
A19-2B12/2D12	11	A20-2B12/2D12	11	4	A19B62			01							
A19-2B13/2D13	11	A19-2A13/2C13	11	4	A22B38			01							
A19-2B13/2D13	22	A19-2A14/2C14	22	4	A22B38			01							
A19-2B14/2D14	11	A19-2A14/2C14	11	4	A22B38			01							
A19-2B14/2D14	22	A19-2A15/2C15	22	4	A22B38			01							
A19-2B15/2D15	11	A19-2A15/2C15	11	4	A22B38			01							
A19-2B15/2D15	22	A19-2A16/2C16	22	4	A22B38			01							
A19-2B16/2D16	11	A19-2A16/2C16	11	4	A22B38			01							

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
	A19-2B16/2D16	22	A19-2A17/2C17	22	4	A22B38			01						
	A19-2B17/2D17	11	A19-2A17/2C17	11	4	A22B38			01						
	A19-2B17/2D17	22	A19-2A18/2C18	22	4	A22B38			01						
	A19-2B18/2D18	11	A19-2A18/2C18	11	4	A22B38			01						
	A19-2B18/2D18	22	A19-2A19/2C19	22	4	A22B38			01						
	A19-2B19/2D19	11	A19-2A19/2C19	11	4	A22B38			01						
	A19-2B19/2D19	22	A19-2A20/2C20	22	4	A22B38			01						
	A19-2B20/2D20	11	A19-2A20/2C20	11	4	A22B38			01						
	A19-2B20/2D20	22	A22-1B38/1D38	22	7	A22B38			01						
	A19-2B21/2D21	11	A20-2B21/2D21	11	4	A20B71			01						
	A19-2B22/2D22	11	A20-2B22/2D22	11	4	A20B72			01						
	A19-2B24/2D24	11	A20-2B24/2D24	11	4	A19B74			01						
	A19-2B25/2D25	11	A14-1A41/1C41	11	8	A19B75			01						
	A19-2B26/2D26	11	A14-1A40/1C40	11	8	A19B76			01						
	A19-2B27/2D27	11	A20-2B27/2D27	11	4	A20B77			01						
	A19-2B28/2D28	11	A20-2B28/2D28	11	4	A19B78			01						
	A19-2B33/2D33	11	A21-2B33/2D33	11	5	A18B83			01						
	A19-2B33/2D33	22	A18-2B33/2D33	22	4	A18B83			01						
	A19-2B34/2D34	11	A21-2B34/2D34	11	5	A18B84			01						
	A19-2B34/2D34	22	A18-2B34/2D34	22	4	A18B84			01						
	A19-2B35/2D35	11	A21-2B35/2D35	11	5	A17B85			01						
	A19-2B35/2D35	22	A17-2B35/2D35	22	5	A17B85			01						
	A19-2B36/2D36	11	A21-2B36/2D36	11	5	A17B86			01						
	A19-2B36/2D36	22	A17-2B36/2D36	22	5	A17B86			01						
	A19-2B37/2D37	11	A21-2B37/2D37	11	5	A17B87			01						
	A19-2B37/2D37	22	A17-2B37/2D37	22	5	A17B87			01						
	A19-2B38/2D38	11	A21-2B38/2D38	11	5	A17B88			01						
	A19-2B38/2D38	22	A17-2B38/2D38	22	5	A17B88			01						
	A19-2B40/2D40	11	A21-2B40/2D40	11	5	A17B90			01						
	A19-2B40/2D40	22	A17-2B40/2D40	22	5	A17B90			01						
	A19-2B41/2D41	11	A21-2B41/2D41	11	5	A17B91			01						
	A19-2B41/2D41	22	A17-2B41/2D41	22	5	A17B91			01						
	A19-2B42/2D42	11	A21-2B42/2D42	11	5	A17B92			01						
	A19-2B42/2D42	22	A17-2B42/2D42	22	5	A17B92			01						

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ORIGIN		LEVS		DESTINATION		LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A19-2B43/2D43		11		A21-2B43/2D43		11	5	A17B93									
A19-2B43/2D43		22		A17-2B43/2D43		22	5	A17B93									

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			ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE						
			A20-1A03/1C03	11	A18-2B21/2D21	11	13	A18B71			01												
			A20-1A04/1C04	11	A18-2A10/2C10	11	13	A18A60			01												
			A20-1A05/1C05	11	A18-2A32/2C32	11	13	A18A82			01												
			A20-1A10/1C10	11	A19-2A33/2C33	11	10	A20A10			01												
			A20-1A17/1C17	11	A19-1A17/1C17	11	4	A20A17			01												
			A20-1A18/1C18	11	A19-1A18/1C18	11	4	A20A18			01												
			A20-1A19/1C19	11	A19-1A19/1C19	11	4	A20A19			01												
			A20-1A20/1C20	11	A19-1A20/1C20	11	4	A19A20			01												
			A20-1A21/1C21	11	A19-1A21/1C21	11	4	A20A21			01												
			A20-1A22/1C22	11	A19-1A22/1C22	11	4	A20A22			01												
			A20-1A24/1C24	11	A19-1A24/1C24	11	4	A20A24			01												
			A20-1A25/1C25	11	A19-1A25/1C25	11	4	A20A25			01												
			A20-1A26/1C26	11	A19-1A26/1C26	11	4	A20A26			01												
			A20-1A27/1C27	11	A19-1A27/1C27	11	4	A20A27			01												
			A20-1A28/1C28	11	A19-1A28/1C28	11	4	A20A28			01												
			A20-1A29/1C29	11	A19-1A29/1C29	11	4	A20A29			01												
			A20-1A30/1C30	11	A19-1A30/1C30	11	4	A19A30			01												
			A20-1A31/1C31	11	A19-1A31/1C31	11	4	A19A31			01												
			A20-1A32/1C32	11	A19-1A32/1C32	11	4	A19A32			01												
			A20-1A33/1C33	11	A19-1A33/1C33	11	4	A19A33			01												
			A20-1A34/1C34	11	A19-1A34/1C34	11	4	A19A34			01												
			A20-1A35/1C35	11	A19-1A35/1C35	11	4	A19A35			01												
			A20-1A36/1C36	11	A19-1A36/1C36	11	4	A19A36			01												
			A20-1A37/1C37	11	A19-1A37/1C37	11	4	A19A37			01												
			A20-1A38/1C38	11	A19-1A38/1C38	11	4	A19A38			01												
			A20-1A40/1C40	11	A19-1A40/1C40	11	4	A20A40			01												

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A20-1A41/1C41	11	A19-1A41/1C41	11	4	A20A41			01							
A20-1A42/1C42	11	A19-1A42/1C42	11	4	A19A42			01							
A20-1A43/1C43	11	A19-1A43/1C43	11	4	A20A43			01							
A20-1B03/1D03	11	A18-2B13/2D13	11	13	A18B63			01							
A20-1B04/1D04	11	A18-1B04/1D04	11	13	A18B04			01							
A20-1B10/1D10	11	A19-1A07/1C07	11	4	A20B10			01							
A20-1B17/1D17	11	A19-1B17/1D17	11	4	A20B17			01							
A20-1B18/1D18	11	A19-1B18/1D18	11	4	A20B18			01							
A20-1B19/1D19	11	A19-1B19/1D19	11	4	A20B19			01							
A20-1B20/1D20	11	A19-1B20/1D20	11	4	A19B20			01							
A20-1B21/1D21	11	A19-1B21/1D21	11	4	A19B21			01							
A20-1B22/1D22	11	A19-1B22/1D22	11	4	A20B22			01							
A20-1B24/1D24	11	A19-1B24/1D24	11	4	A20B24			01							
A20-1B25/1D25	11	A19-1B25/1D25	11	4	A20B25			01							
A20-1B26/1D26	11	A19-1B26/1D26	11	4	A20B26			01							
A20-1B27/1D27	11	A19-1B27/1D27	11	4	A20B27			01							
A20-1B28/1D28	11	A19-1B28/1D28	11	4	A20B28			01							
A20-1B29/1D29	11	A19-1B29/1D29	11	4	A20B29			01							
A20-1B30/1D30	11	A19-1B30/1D30	11	4	A19B30			01							
A20-1B31/1D31	11	A19-1B31/1D31	11	4	A19B31			01							
A20-1B32/1D32	11	A19-1B32/1D32	11	4	A19B32			01							
A20-1B33/1D33	11	A19-1B33/1D33	11	4	A19B33			01							
A20-1B34/1D34	11	A19-1B34/1D34	11	4	A19B34			01							
A20-1B35/1D35	11	A19-1B35/1D35	11	4	A19B35			01							
A20-1B36/1D36	11	A19-1B36/1D36	11	4	A19B36			01							
A20-1B37/1D37	11	A19-1B37/1D37	11	4	A19B37			01							
A20-1B38/1D38	11	A19-1B38/1D38	11	4	A19B38			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A20-1B40/1D40	11	A19-1B40/1D40	11	4	A20B40			01				
A20-1B41/1D41	11	A19-1B41/1D41	11	4	A20B41			01				
A20-1B42/1D42	11	A19-1B42/1D42	11	4	A19B42			01				
A20-1B43/1D43	11	A19-1B43/1D43	11	4	A20B43			01				
A20-2A03/2C03	11	A19-2A03/2C03	11	4	A20A53			01				
A20-2A04/2C04	11	A19-2A04/2C04	11	4	A20A54			01				
A20-2A05/2C05	11	A19-2A05/2C05	11	4	A20A55			01				
A20-2A07/2C07	11	A19-2A07/2C07	11	4	A20A57			01				
A20-2A08/2C08	11	A19-2A08/2C08	11	4	A20A58			01				
A20-2A09/2C09	11	A19-2A09/2C09	11	4	A19A59			01				
A20-2A10/2C10	11	A19-2A10/2C10	11	4	A20A60			01				
A20-2A11/2C11	11	A19-2A11/2C11	11	4	A20A61			01				
A20-2A12/2C12	11	A19-2A12/2C12	11	4	A19A62			01				
A20-2A13/2C13	11	A14-1A38/1C38	11	7	A14A38			01				
A20-2A14/2C14	11	A14-2A13/2C13	11	6	A14A63			01				
A20-2A21/2C21	11	A19-2A21/2C21	11	4	A20A71			01				
A20-2A22/2C22	11	A19-2A22/2C22	11	4	A20A72			01				
A20-2A24/2C24	11	A19-2A24/2C24	11	4	A20A74			01				
A20-2A27/2C27	11	A19-2A27/2C27	11	4	A20A77			01				
A20-2A28/2C28	11	A19-2A28/2C28	11	4	A20A78			01				
A20-2A30/2C30	22	A18-2A30/2C30	22	5	A18A80			01				
A20-2A31/2C31	22	A18-2A31/2C31	22	5	A18A81			01				
A20-2B03/2D03	11	A19-2B03/2D03	11	4	A20B53			01				
A20-2B04/2D04	11	A19-2B04/2D04	11	4	A20B54			01				
A20-2B05/2D05	11	A19-2B05/2D05	11	4	A20B55			01				
A20-2B07/2D07	11	A19-2B07/2D07	11	4	A20B57			01				
A20-2B08/2D08	11	A19-2B08/2D08	11	4	A20B58			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	OSE
A20-2B09/2D09	11	A19-2B09/2D09	11	4	A19B59			01				
A20-2B10/2D10	11	A19-2B10/2D10	11	4	A20B60			01				
A20-2B11/2D11	11	A19-2B11/2D11	11	4	A20B61			01				
A20-2B12/2D12	11	A19-2B12/2D12	11	4	A19B62			01				
A20-2B13/2D13	11	A14-1B38/1D38	11	7	A20B63			01				
A20-2B14/2D14	11	A18-2A17/2C17	11	5	A20B64			01				
A20-2B21/2D21	11	A19-2B21/2D21	11	4	A20B71			01				
A20-2B22/2D22	11	A19-2B22/2D22	11	4	A20B72			01				
A20-2B24/2D24	11	A19-2B24/2D24	11	4	A19B74			01				
A20-2B27/2D27	11	A19-2B27/2D27	11	4	A20B77			01				
A20-2B28/2D28	11	A19-2B28/2D28	11	4	A19B78			01				
A20-2B30/2D30	22	A18-2B30/2D30	22	5	A18B80			01				
A20-2B31/2D31	11	A23-2B31/2D31	11	5	A18B81			01				
A20-2B31/2D31	22	A18-2B31/2D31	22	5	A18B81			01				
A20-2B32/2D32	22	A18-2B32/2D32	22	5	A18B82			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A21-1A03/1C03	11	A22-2A31/2C31	11	11	A22A81			01								
A21-1A05/1C05	11	A22-2B32/2D32	11	11	A22B82			01								
A21-1A07/1C07	11	A18-1B37/1D37	11	13	A18A07			01								
A21-1A08/1C08	11	A19-1A08/1C08	11	5	A18A08			01								
A21-1A08/1C08	22	A25-1A08/1C08	22	6	A18A08			01								
A21-1A09/1C09	11	A19-1A09/1C09	11	5	A18A09			01								
A21-1A09/1C09	22	A25-1A09/1C09	22	6	A18A09			01								
A21-1A10/1C10	11	A19-1A10/1C10	11	5	A18A10			01								
A21-1A10/1C10	22	A25-1A10/1C10	22	6	A18A10			01								
A21-1A11/1C11	11	A19-1A11/1C11	11	5	A18A11			01								
A21-1A11/1C11	22	A25-1A11/1C11	22	6	A18A11			01								
A21-1A12/1C12	11	A19-1A12/1C12	11	5	A18A12			01								
A21-1A12/1C12	22	A26-1A08/1C08	22	6	A18A12			01								
A21-1A13/1C13	11	A19-1A13/1C13	11	5	A18A13			01								
A21-1A13/1C13	22	A26-1A09/1C09	22	6	A18A13			01								
A21-1A14/1C14	11	A19-1A14/1C14	11	5	A18A14			01								
A21-1A14/1C14	22	A26-1A10/1C10	22	6	A18A14			01								
A21-1A15/1C15	11	A19-1A15/1C15	11	5	A18A15			01								
A21-1A15/1C15	22	A26-1A11/1C11	22	6	A18A15			01								
A21-1A16/1C16	11	A19-1A16/1C16	11	5	A18A16			01								
A21-1A16/1C16	22	A25-1A16/1C16	22	6	A18A16			01								
A21-1A17/1C17	11	A22-2A28/2C28	11	9	A22A78			01								
A21-1A18/1C18	11	A22-2A27/2C27	11	9	A22A77			01								
A21-1A19/1C19	11	A22-2A30/2C30	11	9	A22A80			01								
A21-1A20/1C20	11	A22-2B30/2D30	11	9	A22B80			01								
A21-1A22/1C22	11	A27-1A09/1C09	11	6	A21A22			01								
A21-1A24/1C24	11	A27-1A28/1C28	11	6	A21A24			01								
A21-1A25/1C25	11	A27-1A29/1C29	11	6	A21A25			01								
A21-1A26/1C26	11	A27-1A31/1C31	11	6	A21A26			01								
A21-1A27/1C27	11	A27-1A32/1C32	11	6	A21A27			01								
A21-1A28/1C28	11	A27-1A33/1C33	11	6	A21A28			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A21-1A29/1C29	11	A22-2B25/2D25	11	8	A22B75			01				
A21-1A30/1C30	11	A22-2B26/2D26	11	8	A22B76			01				
A21-1A31/1C31	11	A22-2B27/2D27	11	8	A22B77			01				
A21-1A34/1C34	11	A18-1B40/1D40	11	5	A21A34			01				
A21-1A37/1C37	11	A23-2A26/2C26	11	7	A23A76			01				
A21-1A38/1C38	11	A18-2A22/2C22	11	7	A21A38			01				
A21-1A40/1C40	11	A24-2B25/2D25	11	7	A21A40			01				
A21-1B03/1D03	11	A18-2B14/2D14	11	13	A18B64			01				
A21-1B04/1D04	11	A22-2B31/2D31	11	11	A22B81			01				
A21-1B05/1D05	11	A18-1B05/1D05	11	13	A18B05			01				
A21-1B07/1D07	11	A22-2B33/2D33	11	11	A22B83			01				
A21-1B08/1D08	11	A19-1B08/1D08	11	5	A18B08			01				
A21-1B08/1D08	22	A25-1B08/1D08	22	6	A18B08			01				
A21-1B09/1D09	11	A19-1B09/1D09	11	5	A18B09			01				
A21-1B09/1D09	22	A25-1B09/1D09	22	6	A18B09			01				
A21-1B10/1D10	11	A19-1B10/1D10	11	5	A18B10			01				
A21-1B10/1D10	22	A25-1B10/1D10	22	6	A18B10			01				
A21-1B11/1D11	11	A19-1B11/1D11	11	5	A18B11			01				
A21-1B11/1D11	22	A25-1B11/1D11	22	6	A18B11			01				
A21-1B12/1D12	11	A19-1B12/1D12	11	5	A18B12			01				
A21-1B12/1D12	22	A26-1B08/1D08	22	6	A18B12			01				
A21-1B13/1D13	11	A19-1B13/1D13	11	5	A18B13			01				
A21-1B13/1D13	22	A26-1B09/1D09	22	6	A18B13			01				
A21-1B14/1D14	11	A19-1B14/1D14	11	5	A18B14			01				
A21-1B14/1D14	22	A26-1B10/1D10	22	6	A18B14			01				
A21-1B15/1D15	11	A19-1B15/1D15	11	5	A18B15			01				
A21-1B15/1D15	22	A26-1B11/1D11	22	6	A18B15			01				
A21-1B16/1D16	11	A19-1B16/1D16	11	5	A18B16			01				
A21-1B16/1D16	22	A26-1A16/1C16	22	6	A18B16			01				
A21-1B17/1D17	11	A22-2B28/2D28	11	9	A22B78			01				
A21-1B18/1D18	11	A22-2B29/2D29	11	9	A22B79			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A21-1B19/1D19	11	A22-2A29/2C29	11	9	A22A79			01				
A21-1B20/1D20	11	A22-1A43/1C43	11	6	A22A43			01				
A21-1B21/1D21	11	A24-1B24/1D24	11	5	A26A88			01				
A21-1B22/1D22	11	A23-2A34/2C34	11	9	A26A13			01				
A21-1B24/1D24	11	A24-1B21/1D21	11	5	A21B24			01				
A21-1B25/1D25	11	A24-1B22/1D22	11	5	A21B25			01				
A21-1B26/1D26	11	A27-1A16/1C16	11	6	A21B26			01				
A21-1B27/1D27	11	A27-1A17/1C17	11	6	A21B27			01				
A21-1B28/1D28	11	A27-1A18/1C18	11	6	A21B28			01				
A21-1B29/1D29	11	A22-2A26/2C26	11	8	A22A76			01				
A21-1B30/1D30	11	A27-1A34/1C34	11	6	A21B30			01				
A21-1B31/1D31	11	A17-2B25/2D25	11	8	A17B75			01				
A21-1B33/1D33	11	A24-2B34/2D34	11	8	A21B33			01				
A21-1B37/1D37	11	A14-2B11/2D11	11	8	A21B37			01				
A21-1B38/1D38	11	A25-1B12/1D12	11	6	A21B38			01				
A21-2A15/2C15	11	A22-1A32/1C32	11	6	A22A32			01				
A21-2A34/2C34	11	A22-2A34/2C34	11	4	A18A84			01				
A21-2A34/2C34	22	A19-2A34/2C34	22	5	A18A84			01				
A21-2A35/2C35	11	A19-2A35/2C35	11	5	A17A85			01				
A21-2A35/2C35	22	A22-2A35/2C35	22	4	A17A85			01				
A21-2A36/2C36	11	A19-2A36/2C36	11	5	A17A86			01				
A21-2A36/2C36	22	A22-2A36/2C36	22	4	A17A86			01				
A21-2A37/2C37	11	A19-2A37/2C37	11	5	A17A87			01				
A21-2A37/2C37	22	A22-2A37/2C37	22	4	A17A87			01				
A21-2A38/2C38	11	A19-2A38/2C38	11	5	A17A88			01				
A21-2A38/2C38	22	A22-2A38/2C38	22	4	A17A88			01				
A21-2A40/2C40	11	A19-2A40/2C40	11	5	A17A90			01				
A21-2A40/2C40	22	A22-2A40/2C40	22	4	A17A90			01				
A21-2A41/2C41	11	A19-2A41/2C41	11	5	A17A91			01				
A21-2A41/2C41	22	A22-2A41/2C41	22	4	A17A91			01				
A21-2A42/2C42	11	A19-2A42/2C42	11	5	A17A92			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A21-2A42/2C42	22	A22-2A42/2C42	22	4	A17A92			01							
A21-2A43/2C43	11	A19-2A43/2C43	11	5	A17A93			01							
A21-2A43/2C43	22	A22-2A43/2C43	22	4	A17A93			01							
A21-2B05/2D05	11	A21-2B06/2D07	11	3	A21B05			01							
A21-2B06/2D07	11	A21-2B05/2D05	11	3	A21B05			01							
A21-2B15/2D15	11	A22-2B15/2D15	11	4	A22B65			01							
A21-2B33/2D33	11	A19-2B33/2D33	11	5	A18B83			01							
A21-2B33/2D33	22	A25-2B33/2D33	22	6	A18B83			01							
A21-2B34/2D34	11	A19-2B34/2D34	11	5	A18B84			01							
A21-2B34/2D34	22	A25-2B34/2D34	22	6	A18B84			01							
A21-2B35/2D35	11	A19-2B35/2D35	11	5	A17B85			01							
A21-2B35/2D35	22	A22-2B35/2D35	22	4	A17B85			01							
A21-2B36/2D36	11	A19-2B36/2D36	11	5	A17B86			01							
A21-2B36/2D36	22	A22-2B36/2D36	22	4	A17B86			01							
A21-2B37/2D37	11	A19-2B37/2D37	11	5	A17B87			01							
A21-2B37/2D37	22	A22-2B37/2D37	22	4	A17B87			01							
A21-2B38/2D38	11	A19-2B38/2D38	11	5	A17B88			01							
A21-2B38/2D38	22	A22-2B38/2D38	22	4	A17B88			01							
A21-2B40/2D40	11	A19-2B40/2D40	11	5	A17B90			01							
A21-2B40/2D40	22	A22-2B40/2D40	22	4	A17B90			01							
A21-2B41/2D41	11	A19-2B41/2D41	11	5	A17B91			01							
A21-2B41/2D41	22	A22-2B41/2D41	22	4	A17B91			01							
A21-2B42/2D42	11	A19-2B42/2D42	11	5	A17B92			01							
A21-2B42/2D42	22	A22-2B42/2D42	22	4	A17B92			01							
A21-2B43/2D43	11	A19-2B43/2D43	11	5	A17B93			01							
A21-2B43/2D43	22	A22-2B43/2D43	22	4	A17B93			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	QA	TYPE	-----	DESCRIPTION	-----	QSE	
A22-1A03/1C03	11	A18-2B26/2D26	11	13	A18B76			01							
A22-1A04/1C04	11	A18-2A11/2C11	11	13	A18A61			01							
A22-1A05/1C05	11	A24-1A27/1C27	11	6	A22A05			01							
A22-1A17/1C17	11	A27-1B21/1D21	11	6	A22A17			01							
A22-1A21/1C21	11	A23-1B33/1D33	11	8	A23B33			01							
A22-1A22/1C22	11	A24-2A22/2C22	11	8	A25A64			01							
A22-1A24/1C24	11	A23-1A24/1C24	11	4	A23A24			01							
A22-1A25/1C25	11	A23-1A25/1C25	11	4	A23A25			01							
A22-1A26/1C26	11	A23-1A26/1C26	11	4	A23A26			01							
A22-1A27/1C27	11	A23-1A27/1C27	11	4	A23A27			01							
A22-1A28/1C28	11	A23-1A28/1C28	11	4	A23A28			01							
A22-1A29/1C29	11	A23-1A29/1C29	11	4	A23A29			01							
A22-1A30/1C30	11	A23-1A30/1C30	11	4	A23A30			01							
A22-1A31/1C31	11	A23-1A31/1C31	11	4	A23A31			01							
A22-1A32/1C32	11	A21-2A15/2C15	11	6	A22A32			01							
A22-1A33/1C33	11	A23-1B37/1D37	11	4	A23B37			01							
A22-1A33/1C33	22	A25-2B16/2D16	22	7	A23B37			01							
A22-1A34/1C34	11	A27-1B30/1D30	11	6	A22A34			01							
A22-1A35/1C35	11	A25-2B32/2D32	11	8	A22A35			01							
A22-1A36/1C36	11	A23-1A41/1C41	11	4	A23A41			01							
A22-1A36/1C36	22	A25-2B17/2D17	22	7	A23A41			01							
A22-1A37/1C37	11	A23-1A42/1C42	11	4	A23A42			01							
A22-1A37/1C37	22	A25-2B18/2D18	22	7	A23A42			01							
A22-1A38/1C38	11	A25-2A18/2C18	11	7	A22A38			01							
A22-1A40/1C40	11	A24-2B24/2D24	11	7	A16B79			01							
A22-1A40/1C40	22	A18-2B04/2D04	22	6	A16B79			01							
A22-1A42/1C42	11	A23-1B42/1D42	11	4	A23B42			01							
A22-1A43/1C43	11	A21-1B20/1D20	11	6	A22A43			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A22-1B03/1D03	11	A18-2A16/2C16	11	13	A18A66			01							
A22-1B04/1D04	11	A24-1B35/1D35	11	6	A24B35			01							
A22-1B05/1D05	11	A18-2A29/2C29	11	13	A18A79			01							
A22-1B05/1D05	22	A25-1B05/1D05	22	4	A18A79			01							
A22-1B07/1D07	11	A23-2B25/2D25	11	10	A23B75			01							
A22-1B08/1D08	11	A24-2A07/2C07	11	8	A22B08			01							
A22-1B17/1D17	11	A25-1A42/1C42	11	6	A22B17			01							
A22-1B21/1D21	11	A24-1A42/1C42	11	6	A24A42			01							
A22-1B24/1D24	11	A23-1B24/1D24	11	4	A23B24			01							
A22-1B25/1D25	11	A23-1B25/1D25	11	4	A23B25			01							
A22-1B26/1D26	11	A23-1B26/1D26	11	4	A23B26			01							
A22-1B27/1D27	11	A23-1B27/1D27	11	4	A23B27			01							
A22-1B28/1D28	11	A23-1B28/1D28	11	4	A23B28			01							
A22-1B29/1D29	11	A23-1B29/1D29	11	4	A23B29			01							
A22-1B30/1D30	11	A23-1B30/1D30	11	4	A23B30			01							
A22-1B31/1D31	11	A23-1B31/1D31	11	4	A23B31			01							
A22-1B33/1D33	11	A25-1A13/1C13	11	6	A25A13			01							
A22-1B34/1D34	11	A27-1B33/1D33	11	6	A22B34			01							
A22-1B35/1D35	11	A18-2B08/2D08	11	6	A22B35			01							
A22-1B36/1D36	11	A23-1B41/1D41	11	4	A23B41			01							
A22-1B36/1D36	22	A25-2A17/2C17	22	7	A23B41			01							
A22-1B37/1D37	11	A16-2B19/2D19	11	8	A22B37			01							
A22-1B38/1D38	22	A19-2B20/2D20	22	7	A22B38			01							
A22-1B40/1D40	11	A24-2A41/2C41	11	8	A22B40			01							
A22-1B41/1D41	11	A23-1A38/1C38	11	4	A23A38			01							
A22-1B42/1D42	11	A23-2B05/2D05	11	5	A23B55			01							
A22-1B43/1D43	11	A23-1A34/1C34	11	4	A23A34			01							
A22-2A03/2C03	11	A27-2A41/2C41	11	7	A22A53			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A22-2A04/2C04	11	A27-2B33/2D33	11	7	A22A54			01						
A22-2A05/2C05	11	A24-2A25/2C25	11	6	A22A55			01						
A22-2A07/2C07	11	A23-2A07/2C07	11	4	A23A57			01						
A22-2A08/2C08	11	A23-2A08/2C08	11	4	A23A58			01						
A22-2A09/2C09	11	A23-2A09/2C09	11	4	A23A59			01						
A22-2A10/2C10	11	A23-2A10/2C10	11	4	A23A60			01						
A22-2A11/2C11	11	A23-2A11/2C11	11	4	A23A61			01						
A22-2A12/2C12	11	A23-2A12/2C12	11	4	A23A62			01						
A22-2A13/2C13	11	A23-2A13/2C13	11	4	A23A63			01						
A22-2A14/2C14	11	A23-2A14/2C14	11	4	A23A64			01						
A22-2A16/2C16	11	A24-1A22/1C22	11	8	A24A22			01						
A22-2A17/2C17	11	A16-1B36/1D36	11	8	A16B36			01						
A22-2A26/2C26	11	A21-1B29/1D29	11	8	A22A76			01						
A22-2A27/2C27	11	A21-1A18/1C18	11	9	A22A77			01						
A22-2A28/2C28	11	A21-1A17/1C17	11	9	A22A78			01						
A22-2A29/2C29	11	A21-1B19/1D19	11	9	A22A79			01						
A22-2A30/2C30	11	A21-1A19/1C19	11	9	A22A80			01						
A22-2A31/2C31	11	A21-1A03/1C03	11	11	A22A81			01						
A22-2A32/2C32	11	A16-1A20/1C20	11	10	A22A82			01						
A22-2A33/2C33	11	A24-2B41/2D41	11	5	A22A83			01						
A22-2A34/2C34	11	A21-2A34/2C34	11	4	A18A84			01						
A22-2A34/2C34	22	A25-2A34/2C34	22	5	A18A84			01						
A22-2A35/2C35	11	A23-2A35/2C35	11	4	A17A85			01						
A22-2A35/2C35	22	A21-2A35/2C35	22	4	A17A85			01						
A22-2A36/2C36	11	A23-2A36/2C36	11	4	A17A86			01						
A22-2A36/2C36	22	A21-2A36/2C36	22	4	A17A86			01						
A22-2A37/2C37	11	A23-2A37/2C37	11	4	A17A87			01						
A22-2A37/2C37	22	A21-2A37/2C37	22	4	A17A87			01						
A22-2A38/2C38	11	A23-2A38/2C38	11	4	A17A88			01						
A22-2A38/2C38	22	A21-2A38/2C38	22	4	A17A88			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A22-2A40/2C40	11	A23-2A40/2C40	11	4	A17A90			01								
A22-2A40/2C40	22	A21-2A40/2C40	22	4	A17A90			01								
A22-2A41/2C41	11	A23-2A41/2C41	11	4	A17A91			01								
A22-2A41/2C41	22	A21-2A41/2C41	22	4	A17A91			01								
A22-2A42/2C42	11	A23-2A42/2C42	11	4	A17A92			01								
A22-2A42/2C42	22	A21-2A42/2C42	22	4	A17A92			01								
A22-2A43/2C43	11	A23-2A43/2C43	11	4	A17A93			01								
A22-2A43/2C43	22	A21-2A43/2C43	22	4	A17A93			01								
A22-2B03/2D03	11	A27-2B43/2D43	11	7	A22B53			01								
A22-2B04/2D04	22	A18-2B15/2D15	22	6	A22B54			01								
A22-2B07/2D07	11	A23-2B07/2D07	11	4	A23B57			01								
A22-2B08/2D08	11	A23-2B08/2D08	11	4	A23B58			01								
A22-2B09/2D09	11	A23-2B09/2D09	11	4	A23B59			01								
A22-2B10/2D10	11	A23-2B10/2D10	11	4	A23B60			01								
A22-2B11/2D11	11	A23-2B11/2D11	11	4	A23B61			01								
A22-2B12/2D12	11	A23-2B12/2D12	11	4	A23B62			01								
A22-2B13/2D13	11	A23-2B13/2D13	11	4	A23B63			01								
A22-2B14/2D14	11	A23-2B14/2D14	11	4	A23B64			01								
A22-2B15/2D15	11	A21-2B15/2D15	11	4	A22B65			01								
A22-2B16/2D16	11	A18-2A09/2C09	11	6	A17B84			01								
A22-2B25/2D25	11	A21-1A29/1C29	11	8	A22B75			01								
A22-2B26/2D26	11	A21-1A30/1C30	11	8	A22B76			01								
A22-2B27/2D27	11	A21-1A31/1C31	11	8	A22B77			01								
A22-2B28/2D28	11	A21-1B17/1D17	11	9	A22B78			01								
A22-2B29/2D29	11	A21-1B18/1D18	11	9	A22B79			01								
A22-2B30/2D30	11	A21-1A20/1C20	11	9	A22B80			01								
A22-2B31/2D31	11	A21-1B04/1D04	11	11	A22B81			01								
A22-2B32/2D32	11	A21-1A05/1C05	11	11	A22B82			01								
A22-2B33/2D33	11	A21-1B07/1D07	11	11	A22B83			01								

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	ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
	A22-2B34/2D34	11	A25-1A12/1C12	11	10	A22B84			01				
	A22-2B35/2D35	11	A23-2B35/2D35	11	4	A17B85			01				
	A22-2B35/2D35	22	A21-2B35/2D35	22	4	A17B85			01				
	A22-2B36/2D36	11	A23-2B36/2D36	11	4	A17B86			01				
	A22-2B36/2D36	22	A21-2B36/2D36	22	4	A17B86			01				
	A22-2B37/2D37	11	A23-2B37/2D37	11	4	A17B87			01				
	A22-2B37/2D37	22	A21-2B37/2D37	22	4	A17B87			01				
	A22-2B38/2D38	11	A23-2B38/2D38	11	4	A17B88			01				
	A22-2B38/2D38	22	A21-2B38/2D38	22	4	A17B88			01				
	A22-2B40/2D40	11	A23-2B40/2D40	11	4	A17B90			01				
	A22-2B40/2D40	22	A21-2B40/2D40	22	4	A17B90			01				
	A22-2B41/2D41	11	A23-2B41/2D41	11	4	A17B91			01				
	A22-2B41/2D41	22	A21-2B41/2D41	22	4	A17B91			01				
	A22-2B42/2D42	11	A23-2B42/2D42	11	4	A17B92			01				
	A22-2B42/2D42	22	A21-2B42/2D42	22	4	A17B92			01				
	A22-2B43/2D43	11	A23-2B43/2D43	11	4	A17B93			01				
	A22-2B43/2D43	22	A21-2B43/2D43	22	4	A17B93			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A23-1A12/1C12	11	A25-1B18/1D18	11	5	A25B18			01								
A23-1A13/1C13	11	A23-1B34/1D34	11	6	A23B34			01								
A23-1A24/1C24	11	A22-1A24/1C24	11	4	A23A24			01								
A23-1A24/1C24	22	A25-1A24/1C24	22	5	A23A24			01								
A23-1A25/1C25	11	A22-1A25/1C25	11	4	A23A25			01								
A23-1A25/1C25	22	A25-1A25/1C25	22	5	A23A25			01								
A23-1A26/1C26	11	A22-1A26/1C26	11	4	A23A26			01								
A23-1A26/1C26	22	A25-1A26/1C26	22	5	A23A26			01								
A23-1A27/1C27	11	A22-1A27/1C27	11	4	A23A27			01								
A23-1A27/1C27	22	A25-1A27/1C27	22	5	A23A27			01								
A23-1A28/1C28	11	A22-1A28/1C28	11	4	A23A28			01								
A23-1A28/1C28	22	A26-1A24/1C24	22	5	A23A28			01								
A23-1A29/1C29	11	A22-1A29/1C29	11	4	A23A29			01								
A23-1A29/1C29	22	A26-1A25/1C25	22	5	A23A29			01								
A23-1A30/1C30	11	A22-1A30/1C30	11	4	A23A30			01								
A23-1A30/1C30	22	A26-1A26/1C26	22	5	A23A30			01								
A23-1A31/1C31	11	A22-1A31/1C31	11	4	A23A31			01								
A23-1A31/1C31	22	A26-1A27/1C27	22	5	A23A31			01								
A23-1A32/1C32	11	A25-1A07/1C07	11	6	A25A07			01								
A23-1A34/1C34	11	A22-1B43/1D43	11	4	A23A34			01								
A23-1A35/1C35	11	A27-1A22/1C22	11	6	A23A35			01								
A23-1A38/1C38	11	A22-1B41/1D41	11	4	A23A38			01								
A23-1A40/1C40	11	A25-1B41/1D41	11	5	A23A40			01								
A23-1A41/1C41	11	A22-1A36/1C36	11	4	A23A41			01								
A23-1A42/1C42	11	A22-1A37/1C37	11	4	A23A42			01								
A23-1A43/1C43	11	A24-2B40/2D40	11	8	A23A43			01								
A23-1B03/1D03	11	A23-2B27/2D27	11	10	A23B77			01								
A23-1B24/1D24	11	A22-1B24/1D24	11	4	A23B24			01								
A23-1B24/1D24	22	A25-1B24/1D24	22	5	A23B24			01								
A23-1B25/1D25	11	A22-1B25/1D25	11	4	A23B25			01								
A23-1B25/1D25	22	A25-1B25/1D25	22	5	A23B25			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A23-1B26/1D26	11	A22-1B26/1D26	11	4	A23B26			01				
A23-1B26/1D26	22	A25-1B26/1D26	22	5	A23B26			01				
A23-1B27/1D27	11	A22-1B27/1D27	11	4	A23B27			01				
A23-1B27/1D27	22	A25-1B27/1D27	22	5	A23B27			01				
A23-1B28/1D28	11	A22-1B28/1D28	11	4	A23B28			01				
A23-1B28/1D28	22	A26-1B24/1D24	22	5	A23B28			01				
A23-1B29/1D29	11	A22-1B29/1D29	11	4	A23B29			01				
A23-1B29/1D29	22	A26-1B25/1D25	22	5	A23B29			01				
A23-1B30/1D30	11	A22-1B30/1D30	11	4	A23B30			01				
A23-1B30/1D30	22	A26-1B26/1D26	22	5	A23B30			01				
A23-1B31/1D31	11	A22-1B31/1D31	11	4	A23B31			01				
A23-1B31/1D31	22	A26-1B27/1D27	22	5	A23B31			01				
A23-1B33/1D33	11	A22-1A21/1C21	11	5	A23B33			01				
A23-1B34/1D34	11	A23-1A13/1C13	11	6	A23B34			01				
A23-1B35/1D35	11	A25-1A35/1C35	11	4	A23B35			01				
A23-1B37/1D37	11	A22-1A33/1C33	11	4	A23B37			01				
A23-1B38/1D38	11	A26-1B41/1D41	11	5	A23B38			01				
A23-1B41/1D41	11	A22-1B36/1D36	11	4	A23B41			01				
A23-1B42/1D42	11	A22-1A42/1C42	11	4	A23B42			01				
A23-1B42/1D42	22	A24-2A40/2C40	22	8	A23B42			01				
A23-2A03/2C03	11	A25-1A21/1C21	11	6	A25A21			01				
A23-2A05/2C05	11	A24-2B08/2D08	11	4	A23A55			01				
A23-2A07/2C07	11	A22-2A07/2C07	11	4	A23A57			01				
A23-2A07/2C07	22	A25-2A07/2C07	22	5	A23A57			01				
A23-2A08/2C08	11	A22-2A08/2C08	11	4	A23A58			01				
A23-2A08/2C08	22	A25-2A08/2C08	22	5	A23A58			01				
A23-2A09/2C09	11	A22-2A09/2C09	11	4	A23A59			01				
A23-2A09/2C09	22	A25-2A09/2C09	22	5	A23A59			01				
A23-2A10/2C10	11	A22-2A10/2C10	11	4	A23A60			01				
A23-2A10/2C10	22	A25-2A10/2C10	22	5	A23A60			01				
A23-2A11/2C11	11	A22-2A11/2C11	11	4	A23A61			01				
A23-2A11/2C11	22	A26-2A07/2C07	22	5	A23A61			01				
A23-2A12/2C12	11	A22-2A12/2C12	11	4	A23A62			01				
A23-2A12/2C12	22	A26-2A08/2C08	22	5	A23A62			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A23-2A13/2C13	11	A22-2A13/2C13	11	4	A23A63			01								
A23-2A13/2C13	22	A26-2A09/2C09	22	5	A23A63			01								
A23-2A14/2C14	11	A22-2A14/2C14	11	4	A23A64			01								
A23-2A14/2C14	22	A26-2A10/2C10	22	5	A23A64			01								
A23-2A17/2C17	11	A25-2A13/2C13	11	5	A25A63			01								
A23-2A20/2C20	11	A25-2B03/2D03	11	6	A23A70			01								
A23-2A21/2C21	11	A25-2B13/2D13	11	5	A23A71			01								
A23-2A22/2C22	11	A25-2B15/2D15	11	5	A23A72			01								
A23-2A24/2C24	11	A27-2A43/2C43	11	6	A23A74			01								
A23-2A25/2C25	11	A27-2B20/2D20	11	6	A23A75			01								
A23-2A26/2C26	11	A21-1A37/1C37	11	7	A23A76			01								
A23-2A27/2C27	11	A25-2B36/2D36	11	5	A23A77			01								
A23-2A33/2C33	11	A27-1A21/1C21	11	10	A23A83			01								
A23-2A34/2C34	11	A21-1B22/1D22	11	9	A26A13			01								
A23-2A34/2C34	22	A24-2A03/2C03	22	6	A26A13			01								
A23-2A35/2C35	11	A22-2A35/2C35	11	4	A17A85			01								
A23-2A36/2C36	11	A22-2A36/2C36	11	4	A17A86			01								
A23-2A37/2C37	11	A22-2A37/2C37	11	4	A17A87			01								
A23-2A38/2C38	11	A22-2A38/2C38	11	4	A17A88			01								
A23-2A40/2C40	11	A22-2A40/2C40	11	4	A17A90			01								
A23-2A41/2C41	11	A22-2A41/2C41	11	4	A17A91			01								
A23-2A42/2C42	11	A22-2A42/2C42	11	4	A17A92			01								
A23-2A43/2C43	11	A22-2A43/2C43	11	4	A17A93			01								
A23-2B05/2D05	11	A22-1B42/1D42	11	5	A23B55			01								
A23-2B05/2D05	22	A25-1A41/1C41	22	6	A23B55			01								
A23-2B07/2D07	11	A22-2B07/2D07	11	4	A23B57			01								
A23-2B07/2D07	22	A25-2B07/2D07	22	5	A23B57			01								
A23-2B08/2D08	11	A22-2B08/2D08	11	4	A23B58			01								
A23-2B08/2D08	22	A25-2B08/2D08	22	5	A23B58			01								
A23-2B09/2D09	11	A22-2B09/2D09	11	4	A23B59			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A23-2B09/2D09	22	A25-2B09/2D09	22	5	A23B59			01				
A23-2B10/2D10	11	A22-2B10/2D10	11	4	A23B60			01				
A23-2B10/2D10	22	A25-2B10/2D10	22	5	A23B60			01				
A23-2B11/2D11	11	A22-2B11/2D11	11	4	A23B61			01				
A23-2B11/2D11	22	A26-2B07/2D07	22	5	A23B61			01				
A23-2B12/2D12	11	A22-2B12/2D12	11	4	A23B62			01				
A23-2B12/2D12	22	A26-2B08/2D08	22	5	A23B62			01				
A23-2B13/2D13	11	A22-2B13/2D13	11	4	A23B63			01				
A23-2B13/2D13	22	A26-2B09/2D09	22	5	A23B63			01				
A23-2B14/2D14	11	A22-2B14/2D14	11	4	A23B64			01				
A23-2B14/2D14	22	A26-2B10/2D10	22	5	A23B64			01				
A23-2B19/2D19	11	A16-2A21/2C21	11	7	A23B69			01				
A23-2B19/2D19	22	A18-1A22/1C22	22	9	A23B69			01				
A23-2B20/2D20	11	A25-1B42/1D42	11	6	A23B70			01				
A23-2B21/2D21	11	A27-2B11/2D11	11	6	A23B71			01				
A23-2B22/2D22	11	A24-1A41/1C41	11	6	A23B72			01				
A23-2B24/2D24	11	A27-2B17/2D17	11	6	A23B74			01				
A23-2B25/2D25	11	A22-1B07/1D07	11	10	A23B75			01				
A23-2B26/2D26	11	A27-2B35/2D35	11	6	A23B76			01				
A23-2B27/2D27	11	A23-1B03/1D03	11	10	A23B77			01				
A23-2B31/2D31	11	A20-2B31/2D31	11	5	A18B81			01				
A23-2B31/2D31	22	A25-2B31/2D31	22	5	A18B81			01				
A23-2B33/2D33	11	A27-1B22/1D22	11	10	A23B83			01				
A23-2B34/2D34	11	A27-2B36/2D36	11	6	A23B84			01				
A23-2B35/2D35	11	A22-2B35/2D35	11	4	A17B85			01				
A23-2B36/2D36	11	A22-2B36/2D36	11	4	A17B86			01				
A23-2B37/2D37	11	A22-2B37/2D37	11	4	A17B87			01				
A23-2B38/2D38	11	A22-2B38/2D38	11	4	A17B88			01				
A23-2B40/2D40	11	A22-2B40/2D40	11	4	A17B90			01				
A23-2B41/2D41	11	A22-2B41/2D41	11	4	A17B91			01				
A23-2B42/2D42	11	A22-2B42/2D42	11	4	A17B92			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A24-1A07/1C07	11	A18-1A07/1C07	11	13	A18A07			01				
A24-1A08/1C08	11	A15-1A08/1C08	11	8	A24A08			01				
A24-1A09/1C09	11	A17-2A26/2C26	11	11	A24A09			01				
A24-1A10/1C10	11	A15-1A10/1C10	11	8	A24A10			01				
A24-1A11/1C11	11	A15-2B14/2D14	11	10	A24A11			01				
A24-1A12/1C12	11	A15-1A09/1C09	11	8	A24A12			01				
A24-1A21/1C21	11	A25-1A31/1C31	11	5	A25A31			01				
A24-1A22/1C22	11	A22-2A16/2C16	11	8	A24A22			01				
A24-1A27/1C27	11	A22-1A05/1C05	11	6	A22A05			01				
A24-1A32/1C32	11	A27-1A30/1C30	11	5	A24A32			01				
A24-1A33/1C33	11	A25-1A43/1C43	11	5	A25A43			01				
A24-1A36/1C36	11	A25-1B43/1D43	11	5	A25B43			01				
A24-1A40/1C40	22	A25-2A18/2C18	22	6	A22A38			01				
A24-1A41/1C41	11	A23-2B22/2D22	11	6	A23B72			01				
A24-1A42/1C42	11	A22-1B21/1D21	11	6	A24A42			01				
A24-1A42/1C42	22	A25-1A22/1C22	22	6	A24A42			01				
A24-1B05/1D05	11	A18-1A37/1C37	11	13	A18A37			01				
A24-1B18/1D18	11	A25-2B43/2D43	11	11	A25B93			01				
A24-1B21/1D21	11	A21-1B24/1D24	11	5	A21B24			01				
A24-1B22/1D22	11	A21-1B25/1D25	11	5	A21B25			01				
A24-1B24/1D24	11	A21-1B21/1D21	11	5	A26A88			01				
A24-1B24/1D24	22	A26-2A38/2C38	22	10	A26A88			01				
A24-1B25/1D25	11	A27-2B31/2D31	11	9	A24B25			01				
A24-1B26/1D26	11	A26-2A31/2C31	11	9	A24B26			01				
A24-1B32/1D32	11	A25-2A15/2C15	11	6	A25A65			01				
A24-1B35/1D35	11	A22-1B04/1D04	11	6	A24B35			01				
A24-1B36/1D36	11	A25-1B38/1D38	11	4	A25B38			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	OSE
A24-1B40/1D40	11	A25-1A28/1C28	11	5	A25A83			01				
A24-1B43/1D43	11	A25-2B14/2D14	11	6	A24B43			01				
A24-2A03/2C03	11	A26-1A13/1C13	11	7	A26A13			01				
A24-2A03/2C03	22	A23-2A34/2C34	22	6	A26A13			01				
A24-2A04/2C04	11	A27-1A12/1C12	11	8	A24A54			01				
A24-2A05/2C05	11	A25-2B42/2D42	11	6	A25B92			01				
A24-2A07/2C07	11	A22-1B08/1D08	11	8	A22B08			01				
A24-2A07/2C07	22	A25-2B35/2D35	22	5	A22B08			01				
A24-2A08/2C08	11	A27-1B13/1D13	11	8	A27B13			01				
A24-2A09/2C09	11	A25-2A30/2C30	11	6	A25A80			01				
A24-2A10/2C10	11	A26-1B26/1D26	11	7	A23B30			01				
A24-2A11/2C11	11	A25-1A38/1C38	11	6	A25A38			01				
A24-2A12/2C12	11	A25-1A40/1C40	11	6	A24A62			01				
A24-2A13/2C13	11	A25-1A30/1C30	11	6	A25A30			01				
A24-2A14/2C14	11	A26-1B25/1D25	11	7	A23B29			01				
A24-2A15/2C15	11	A26-1B24/1D24	11	7	A23B28			01				
A24-2A16/2C16	11	A26-1B28/1D28	11	7	A26B28			01				
A24-2A17/2C17	11	A25-2B37/2D37	11	6	A25B87			01				
A24-2A18/2C18	11	A25-2A37/2C37	11	5	A25A87			01				
A24-2A19/2C19	11	A25-1A32/1C32	11	7	A25A32			01				
A24-2A22/2C22	11	A22-1A22/1C22	11	8	A25A64			01				
A24-2A22/2C22	22	A25-2A14/2C14	22	4	A25A64			01				
A24-2A25/2C25	11	A22-2A05/2C05	11	6	A22A55			01				
A24-2A25/2C25	22	A25-1B40/1D40	22	7	A22A55			01				
A24-2A26/2C26	22	A27-1B27/1D27	22	8	A23B27			01				
A24-2A27/2C27	22	A27-1B26/1D26	22	9	A23B26			01				
A24-2A28/2C28	11	A25-1B28/1D28	11	8	A25B28			01				
A24-2A29/2C29	11	A25-1A37/1C37	11	7	A25A37			01				
A24-2A30/2C30	11	A27-2A17/2C17	11	6	A27A67			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A24-2A31/2C31	22	A27-1B24/1D24	22	9	A23B24			01							
A24-2A32/2C32	22	A27-1A24/1C24	22	9	A23A24			01							
A24-2A33/2C33	11	A26-2B30/2D30	11	5	A26B80			01							
A24-2A35/2C35	11	A25-2A42/2C42	11	4	A25A92			01							
A24-2A36/2C36	11	A25-1A33/1C33	11	8	A24A86			01							
A24-2A37/2C37	11	A25-2A31/2C31	11	4	A24A87			01							
A24-2A38/2C38	11	A25-1B07/1D07	11	11	A25B07			01							
A24-2A40/2C40	22	A23-1B42/1D42	22	8	A23B42			01							
A24-2A41/2C41	11	A22-1B40/1D40	11	8	A22B40			01							
A24-2A42/2C42	22	A27-1B21/1D21	22	10	A22A17			01							
A24-2A43/2C43	11	A27-2B12/2D12	11	6	A24A93			01							
A24-2B03/2D03	11	A25-2B38/2D38	11	6	A24B53			01							
A24-2B04/----		A24-2D04/----			GRNDXX			01							
A24-2B05/2D05	11	A25-2A32/2C32	11	6	A24B55			01							
A24-2B08/2D08	11	A23-2A05/2C05	11	4	A23A55			01							
A24-2B09/2D09	11	A26-1B27/1D27	11	6	A23B31			01							
A24-2B10/2D10	11	A26-1A27/1C27	11	7	A23A31			01							
A24-2B11/2D11	11	A26-1A26/1C26	11	7	A23A30			01							
A24-2B12/2D12	11	A25-2B40/2D40	11	6	A24B62			01							
A24-2B13/2D13	11	A25-2A43/2C43	11	6	A24B63			01							
A24-2B14/2D14	11	A25-1B30/1D30	11	7	A25B30			01							
A24-2B15/2D15	11	A26-1A25/1C25	11	7	A23A29			01							
A24-2B16/2D16	11	A26-1A24/1C24	11	7	A23A28			01							
A24-2B17/2D17	11	A25-2B30/2D30	11	5	A25B80			01							
A24-2B18/----		A24-2D18/----			GRNDXX			01							
A24-2B21/----		A24-2D21/----			GRNDXX			01							
A24-2B22/2D22	11	A27-2A05/2C05	11	6	A24B72			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A24-2B24/2D24	11	A22-1A40/1C40	11	7	A16B79			01				
A24-2B24/2D24	22	A25-1B29/1D29	22	8	A16B79			01				
A24-2B25/2D25	11	A21-1A40/1C40	11	7	A21A40			01				
A24-2B26/2D26	11	A18-1B32/1D32	11	9	A18B32			01				
A24-2B27/2D27	22	A27-1A27/1C27	22	8	A23A27			01				
A24-2B28/2D28	22	A27-1A26/1C26	22	9	A23A26			01				
A24-2B30/2D30	22	A27-1B25/1D25	22	9	A23B25			01				
A24-2B31/2D31	22	A27-1A25/1C25	22	9	A23A25			01				
A24-2B32/2D32	11	A25-2A03/2C03	11	5	A25A53			01				
A24-2B33/2D33	11	A27-2B03/2D03	11	6	A27B53			01				
A24-2B34/2D34	11	A21-1B33/1D33	11	8	A21B33			01				
A24-2B35/2D35	11	A25-2A41/2C41	11	4	A25A91			01				
A24-2B36/2D36	11	A25-1B33/1D33	11	8	A24B86			01				
A24-2B37/2D37	11	A25-1A29/1C29	11	9	A25A29			01				
A24-2B38/2D38	11	A27-1B35/1D35	11	9	A24B88			01				
A24-2B40/2D40	11	A23-1A43/1C43	11	8	A23A43			01				
A24-2B41/2D41	11	A22-2A33/2C33	11	5	A22A83			01				
A24-2B41/2D41	22	A25-2A16/2C16	22	6	A22A83			01				
A24-2B42/2D42	11	A27-2A12/2C12	11	6	A24B92			01				
A24-2B43/2D43	11	A27-1B18/1D18	11	11	A24B93			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A25-1A03/1C03	11	A18-2B27/2D27	11	13	A18B77			01						
A25-1A04/1C04	11	A18-2B11/2D11	11	13	A18B61			01						
A25-1A05/1C05	11	A18-2A33/2C33	11	13	A18A83			01						
A25-1A05/1C05	22	A26-1A05/1C05	22	4	A18A83			01						
A25-1A07/1C07	11	A23-1A32/1C32	11	6	A25A07			01						
A25-1A08/1C08	22	A21-1A08/1C08	22	6	A18A08			01						
A25-1A09/1C09	22	A21-1A09/1C09	22	6	A18A09			01						
A25-1A10/1C10	22	A21-1A10/1C10	22	6	A18A10			01						
A25-1A11/1C11	22	A21-1A11/1C11	22	6	A18A11			01						
A25-1A12/1C12	11	A22-2B34/2D34	11	10	A22B84			01						
A25-1A12/1C12	22	A26-1A12/1C12	22	4	A22B84			01						
A25-1A13/1C13	11	A22-1B33/1D33	11	6	A25A13			01						
A25-1A14/1C14	11	A25-1A19/1C19	11	4	A25A14			01						
A25-1A15/1C15	11	A27-2B26/2D26	11	9	A25A15			01						
A25-1A16/1C16	22	A21-1A16/1C16	22	6	A18A16			01						
A25-1A17/1C17	11	A27-2B34/2D34	11	10	A25A17			01						
A25-1A18/1C18	11	A27-2A27/2C27	11	9	A25A18			01						
A25-1A19/1C19	11	A25-1A14/1C14	11	4	A25A14			01						
A25-1A20/1C20	11	A27-2B30/2D30	11	9	A25A20			01						
A25-1A21/1C21	11	A23-2A03/2C03	11	6	A25A21			01						
A25-1A22/1C22	22	A24-1A42/1C42	22	6	A24A42			01						
A25-1A24/1C24	11	A27-1A24/1C24	11	5	A23A24			01						
A25-1A24/1C24	22	A23-1A24/1C24	22	5	A23A24			01						
A25-1A25/1C25	11	A27-1A25/1C25	11	5	A23A25			01						
A25-1A25/1C25	22	A23-1A25/1C25	22	5	A23A25			01						
A25-1A26/1C26	11	A27-1A26/1C26	11	5	A23A26			01						
A25-1A26/1C26	22	A23-1A26/1C26	22	5	A23A26			01						
A25-1A27/1C27	11	A27-1A27/1C27	11	5	A23A27			01						
A25-1A27/1C27	22	A23-1A27/1C27	22	5	A23A27			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A25-1A28/1C28	11	A24-1B40/1D40	11	5	A25A83			01						
A25-1A28/1C28	22	A26-1A28/1C28	22	4	A25A83			01						
A25-1A29/1C29	11	A24-2B37/2D37	11	9	A25A29			01						
A25-1A30/1C30	11	A24-2A13/2C13	11	6	A25A30			01						
A25-1A31/1C31	11	A24-1A21/1C21	11	5	A25A31			01						
A25-1A32/1C32	11	A24-2A19/2C19	11	7	A25A32			01						
A25-1A33/1C33	11	A24-2A36/2C36	11	8	A24A86			01						
A25-1A35/1C35	11	A23-1B35/1D35	11	4	A23B35			01						
A25-1A35/1C35	22	A26-1A35/1C35	22	4	A23B35			01						
A25-1A36/1C36	11	A26-1A19/1C19	11	5	A25A36			01						
A25-1A37/1C37	11	A24-2A29/2C29	11	7	A25A37			01						
A25-1A38/1C38	11	A24-2A11/2C11	11	6	A25A38			01						
A25-1A40/1C40	11	A24-2A12/2C12	11	6	A24A62			01						
A25-1A41/1C41	11	A26-1A41/1C41	11	4	A23B55			01						
A25-1A41/1C41	22	A23-2B05/2D05	22	6	A23B55			01						
A25-1A42/1C42	11	A22-1B17/1D17	11	6	A22B17			01						
A25-1A43/1C43	11	A24-1A33/1C33	11	5	A25A43			01						
A25-1B03/1D03	11	A18-2B19/2D19	11	13	A18B69			01						
A25-1B04/1D04	11	A18-1A32/1C32	11	13	A18A32			01						
A25-1B05/1D05	22	A22-1B05/1D05	22	4	A18A79			01						
A25-1B07/1D07	11	A24-2A38/2C38	11	11	A25B07			01						
A25-1B08/1D08	22	A21-1B08/1D08	22	6	A18B08			01						
A25-1B09/1D09	22	A21-1B09/1D09	22	6	A18B09			01						
A25-1B10/1D10	22	A21-1B10/1D10	22	6	A18B10			01						
A25-1B11/1D11	22	A21-1B11/1D11	22	6	A18B11			01						
A25-1B12/1D12	11	A21-1B38/1D38	11	6	A21B38			01						
A25-1B12/1D12	22	A26-1B12/1D12	22	4	A21B38			01						
A25-1B13/1D13	11	A26-1B32/1D32	11	5	A26B32			01						
A25-1B14/1D14	11	A27-2A26/2C26	11	9	A25B14			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A25-1B15/1D15	11	A27-2B29/2D29	11	10	A25B15			01				
A25-1B16/1D16	11	A27-2A29/2C29	11	9	A25B16			01				
A25-1B17/1D17	11	A25-1B34/1D34	11	5	A25B17			01				
A25-1B18/1D18	11	A23-1A12/1C12	11	5	A25B18			01				
A25-1B19/1D19	11	A27-2B27/2D27	11	9	A25B19			01				
A25-1B20/1D20	11	A25-2B25/2D25	11	9	A25B75			01				
A25-1B21/1D21	11	A27-2A30/2C30	11	9	A25B21			01				
A25-1B24/1D24	11	A27-1B24/1D24	11	5	A23B24			01				
A25-1B24/1D24	22	A23-1B24/1D24	22	5	A23B24			01				
A25-1B25/1D25	11	A27-1B25/1D25	11	5	A23B25			01				
A25-1B25/1D25	22	A23-1B25/1D25	22	5	A23B25			01				
A25-1B26/1D26	11	A27-1B26/1D26	11	5	A23B26			01				
A25-1B26/1D26	22	A23-1B26/1D26	22	5	A23B26			01				
A25-1B27/1D27	11	A27-1B27/1D27	11	5	A23B27			01				
A25-1B27/1D27	22	A23-1B27/1D27	22	5	A23B27			01				
A25-1B28/1D28	11	A24-2A28/2C28	11	8	A25B28			01				
A25-1B29/1D29	22	A24-2B24/2D24	22	8	A16B79			01				
A25-1B30/1D30	11	A24-2B14/2D14	11	7	A25B30			01				
A25-1B33/1D33	11	A24-2B36/2D36	11	8	A24B86			01				
A25-1B34/1D34	11	A25-1B17/1D17	11	5	A25B17			01				
A25-1B34/1D34	22	A26-1B34/1D34	22	4	A25B17			01				
A25-1B36/1D36	11	A26-1B37/1D37	11	4	A26B37			01				
A25-1B38/1D38	11	A24-1B36/1D36	11	4	A25B38			01				
A25-1B40/1D40	22	A24-2A25/2C25	22	7	A22A55			01				
A25-1B41/1D41	11	A23-1A40/1C40	11	5	A23A40			01				
A25-1B42/1D42	11	A23-2B20/2D20	11	6	A23B70			01				
A25-1B43/1D43	11	A24-1A36/1C36	11	5	A25B43			01				
A25-2A03/2C03	11	A24-2B32/2D32	11	5	A25A53			01				
A25-2A04/2C04	11	A27-1B37/1D37	11	6	A27B37			01				
A25-2A05/2C05	11	A27-1A40/1C40	11	6	A27A40			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A25-2A07/2C07	11	A27-2A07/2C07	11	5	A23A57			01						
A25-2A07/2C07	22	A23-2A07/2C07	22	5	A23A57			01						
A25-2A08/2C08	11	A27-2A08/2C08	11	5	A23A58			01						
A25-2A08/2C08	22	A23-2A08/2C08	22	5	A23A58			01						
A25-2A09/2C09	11	A27-2A09/2C09	11	5	A23A59			01						
A25-2A09/2C09	22	A23-2A09/2C09	22	5	A23A59			01						
A25-2A10/2C10	11	A27-2A10/2C10	11	5	A23A60			01						
A25-2A10/2C10	22	A23-2A10/2C10	22	5	A23A60			01						
A25-2A11/2C11	11	A27-1A38/1C38	11	6	A27A38			01						
A25-2A12/2C12	11	A27-1B42/1D42	11	6	A27B42			01						
A25-2A13/2C13	11	A23-2A17/2C17	11	5	A25A63			01						
A25-2A14/2C14	22	A24-2A22/2C22	22	4	A25A64			01						
A25-2A15/2C15	11	A24-1B32/1D32	11	6	A25A65			01						
A25-2A16/2C16	22	A24-2B41/2D41	22	6	A22A83			01						
A25-2A17/2C17	11	A26-2A17/2C17	11	4	A23B41			01						
A25-2A17/2C17	22	A22-1B36/1D36	22	7	A23B41			01						
A25-2A18/2C18	11	A22-1A38/1C38	11	7	A22A38			01						
A25-2A18/2C18	22	A24-1A40/1C40	22	6	A22A38			01						
A25-2A24/2C24	11	A27-1B10/1D10	11	10	A27B10			01						
A25-2A25/2C25	11	A26-1B20/1D20	11	9	A25A75			01						
A25-2A27/----		A25-2C27/----			GRNDXX			01						
A25-2A30/2C30	11	A24-2A09/2C09	11	6	A25A80			01						
A25-2A31/2C31	11	A24-2A37/2C37	11	4	A24A87			01						
A25-2A32/2C32	11	A24-2B05/2D05	11	6	A24B55			01						
A25-2A33/2C33	22	A27-2A16/2C16	22	6	A25A83			01						
A25-2A34/2C34	22	A22-2A34/2C34	22	5	A18A84			01						
A25-2A35/----		A25-2C35/----			GRNDXX			01						
A25-2A37/2C37	11	A24-2A18/2C18	11	5	A25A87			01						
A25-2A41/2C41	11	A24-2B35/2D35	11	4	A25A91			01						
A25-2A42/2C42	11	A24-2A35/2C35	11	4	A25A92			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A25-2A43/2C43	11	A24-2B13/2D13	11	6	A24B63			01							
A25-2B03/2D03	11	A23-2A20/2C20	11	6	A23A70			01							
A25-2B03/2D03	22	A26-2B03/2D03	22	4	A23A70			01							
A25-2B04/2D04	11	A27-1B41/1D41	11	6	A27B41			01							
A25-2B05/2D05	11	A27-1B40/1D40	11	6	A27B40			01							
A25-2B07/2D07	11	A27-2B07/2D07	11	5	A23B57			01							
A25-2B07/2D07	22	A23-2B07/2D07	22	5	A23B57			01							
A25-2B08/2D08	11	A27-2B08/2D08	11	5	A23B58			01							
A25-2B08/2D08	22	A23-2B08/2D08	22	5	A23B58			01							
A25-2B09/2D09	11	A27-2B09/2D09	11	5	A23B59			01							
A25-2B09/2D09	22	A23-2B09/2D09	22	5	A23B59			01							
A25-2B10/2D10	11	A27-2B10/2D10	11	5	A23B60			01							
A25-2B10/2D10	22	A23-2B10/2D10	22	5	A23B60			01							
A25-2B11/2D11	11	A27-1A41/1C41	11	6	A27A41			01							
A25-2B12/2D12	11	A27-1A42/1C42	11	6	A27A42			01							
A25-2B13/2D13	11	A23-2A21/2C21	11	5	A23A71			01							
A25-2B13/2D13	22	A27-1B12/1D12	22	8	A23A71			01							
A25-2B14/2D14	11	A24-1B43/1D43	11	6	A24B43			01							
A25-2B14/2D14	22	A26-2B14/2D14	22	4	A24B43			01							
A25-2B15/2D15	11	A23-2A22/2C22	11	5	A23A72			01							
A25-2B15/2D15	22	A26-2B15/2D15	22	4	A23A72			01							
A25-2B16/2D16	11	A26-2B16/2D16	11	4	A23B37			01							
A25-2B16/2D16	22	A22-1A33/1C33	22	7	A23B37			01							
A25-2B17/2D17	11	A26-2B17/2D17	11	4	A23A41			01							
A25-2B17/2D17	22	A22-1A36/1C36	22	7	A23A41			01							
A25-2B18/2D18	11	A26-2B18/2D18	11	4	A23A42			01							
A25-2B18/2D18	22	A22-1A37/1C37	22	7	A23A42			01							
A25-2B22/2D22	11	A27-1A37/1C37	11	7	A27A37			01							
A25-2B25/2D25	11	A25-1B20/1D20	11	9	A25B75			01							
A25-2B26/2D26	22	A16-1B36/1D36	22	10	A16B36			01							
A25-2B27/----		A25-2D27/----			GRNDXX			01							
A25-2B28/2D28	11	A27-2A03/2C03	11	6	A27A53			01							

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A25-2B29/2D29	11	A26-2A29/2C29	11	4	A26A79			01						
A25-2B30/2D30	11	A24-2B17/2D17	11	5	A25B80			01						
A25-2B31/2D31	11	A26-2B31/2D31	11	4	A18B81			01						
A25-2B31/2D31	22	A23-2B31/2D31	22	5	A18B81			01						
A25-2B32/2D32	11	A22-1A35/1C35	11	8	A22A35			01						
A25-2B33/2D33	22	A21-2B33/2D33	22	6	A18B83			01						
A25-2B34/2D34	22	A21-2B34/2D34	22	6	A18B84			01						
A25-2B35/2D35	22	A24-2A07/2C07	22	5	A22B08			01						
A25-2B36/2D36	11	A23-2A27/2C27	11	5	A23A77			01						
A25-2B36/2D36	22	A26-2B36/2D36	22	4	A23A77			01						
A25-2B37/2D37	11	A24-2A17/2C17	11	6	A25B87			01						
A25-2B38/2D38	11	A24-2B03/2D03	11	6	A24B53			01						
A25-2B38/2D38	22	A26-2B38/2D38	22	4	A24B53			01						
A25-2B40/2D40	11	A24-2B12/2D12	11	6	A24B62			01						
A25-2B41/2D41	22	A27-2A05/2C05	22	6	A24B72			01						
A25-2B42/2D42	11	A24-2A05/2C05	11	6	A25B92			01						
A25-2B43/2D43	11	A24-1B18/1D18	11	11	A25B93			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE	
A26-1A05/1C05	22	A25-1A05/1C05	22	4	A18A83			01							
A26-1A08/1C08	22	A21-1A12/1C12	22	6	A18A12			01							
A26-1A09/1C09	22	A21-1A13/1C13	22	6	A18A13			01							
A26-1A10/1C10	22	A21-1A14/1C14	22	6	A18A14			01							
A26-1A11/1C11	22	A21-1A15/1C15	22	6	A18A15			01							
A26-1A12/1C12	22	A25-1A12/1C12	22	4	A22B84			01							
A26-1A13/1C13	11	A24-2A03/2C03	11	7	A26A13			01							
A26-1A15/1C15	11	A27-1B14/1D14	11	4	A26A15			01							
A26-1A16/1C16	22	A21-1B16/1D16	22	6	A18B16			01							
A26-1A17/1C17	11	A27-1A11/1C11	11	4	A26A17			01							
A26-1A18/1C18	11	A27-1B19/1D19	11	4	A26A18			01							
A26-1A19/1C19	11	A25-1A36/1C36	11	5	A25A36			01							
A26-1A20/1C20	11	A27-1B20/1D20	11	4	A26A20			01							
A26-1A24/1C24	11	A24-2B16/2D16	11	7	A23A28			01							
A26-1A24/1C24	22	A23-1A28/1C28	22	5	A23A28			01							
A26-1A25/1C25	11	A24-2B15/2D15	11	7	A23A29			01							
A26-1A25/1C25	22	A23-1A29/1C29	22	5	A23A29			01							
A26-1A26/1C26	11	A24-2B11/2D11	11	7	A23A30			01							
A26-1A26/1C26	22	A23-1A30/1C30	22	5	A23A30			01							
A26-1A27/1C27	11	A24-2B10/2D10	11	7	A23A31			01							
A26-1A27/1C27	22	A23-1A31/1C31	22	5	A23A31			01							
A26-1A28/1C28	11	A27-2A16/2C16	11	7	A25A83			01							
A26-1A28/1C28	22	A25-1A28/1C28	22	4	A25A83			01							
A26-1A35/1C35	22	A25-1A35/1C35	22	4	A23B35			01							
A26-1A40/----		A26-1C40/----			GRNDXX			01							
A26-1A41/1C41	11	A25-1A41/1C41	11	4	A23B55			01							
A26-1B08/1D08	22	A21-1B12/1D12	22	6	A18B12			01							
A26-1B09/1D09	22	A21-1B13/1D13	22	6	A18B13			01							
A26-1B10/1D10	22	A21-1B14/1D14	22	6	A18B14			01							

PAGE	117	PACK	A26 60000496 REV A										DATE 90/01/19			
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE		
A26-1B11/1D11	22	A21-1B15/1D15	22	6	A18R15			01								
A26-1B12/1D12	22	A25-1B12/1D12	22	4	A21B38			01								
A26-1B14/1D14	11	A27-1A13/1C13	11	4	A26B14			01								
A26-1B15/1D15	11	A27-1A14/1C14	11	4	A26B15			01								
A26-1B16/1D16	11	A27-1B15/1D15	11	4	A26B16			01								
A26-1B19/1D19	11	A27-1A19/1C19	11	4	A26B19			01								
A26-1B20/1D20	11	A25-2A25/2C25	11	9	A25A75			01								
A26-1B21/1D21	11	A27-1A20/1C20	11	4	A26B21			01								
A26-1B24/1D24	11	A24-2A15/2C15	11	7	A23B28			01								
A26-1B24/1D24	22	A23-1B28/1D28	22	5	A23B28			01								
A26-1B25/1D25	11	A24-2A14/2C14	11	7	A23B29			01								
A26-1B25/1D25	22	A23-1B29/1D29	22	5	A23B29			01								
A26-1B26/1D26	11	A24-2A10/2C10	11	7	A23B30			01								
A26-1B26/1D26	22	A23-1B30/1D30	22	5	A23B30			01								
A26-1B27/1D27	11	A24-2B09/2D09	11	6	A23B31			01								
A26-1B27/1D27	22	A23-1B31/1D31	22	5	A23B31			01								
A26-1B28/1D28	11	A24-2A16/2C16	11	7	A26B28			01								
A26-1B32/1D32	11	A25-1B13/1D13	11	5	A26B32			01								
A26-1B34/1D34	22	A25-1B34/1D34	22	4	A25B17			01								
A26-1B37/1D37	11	A25-1B36/1D36	11	4	A26B37			01								
A26-1B41/1D41	11	A23-1B38/1D38	11	5	A23B38			01								
A26-2A04/2C04	11	A27-2B32/2D32	11	6	A27B82			01								
A26-2A05/2C05	11	A27-2A38/2C38	11	6	A27A88			01								
A26-2A07/2C07	22	A23-2A11/2C11	22	5	A23A61			01								
A26-2A08/2C08	22	A23-2A12/2C12	22	5	A23A62			01								
A26-2A09/2C09	22	A23-2A13/2C13	22	5	A23A63			01								
A26-2A10/2C10	22	A23-2A14/2C14	22	5	A23A64			01								
A26-2A11/2C11	11	A27-2A35/2C35	11	6	A27A85			01								
A26-2A12/2C12	11	A27-2B40/2D40	11	6	A27B90			01								

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A05-1A30/1C30	11	A06-1A30/1C30	11	4	A05A30			01				
A05-1A31/1C31	11	A06-1A31/1C31	11	4	A05A31			01				
A05-1A32/1C32	11	A06-1A32/1C32	11	4	A05A32			01				
A05-1A33/1C33	11	A06-1A33/1C33	11	4	A05A33			01				
A05-1A34/1C34	11	A06-1A34/1C34	11	4	A05A34			01				
A05-1A35/1C35	11	A06-1A35/1C35	11	4	A05A35			01				
A05-1A36/1C36	11	A06-1A36/1C36	11	4	A05A36			01				
A05-1A37/1C37	11	A06-1A37/1C37	11	4	A05A37			01				
A05-1A38/1C38	11	A06-1A38/1C38	11	4	A05A38			01				
A05-1A40/1C40	11	A06-1A40/1C40	11	4	A06A40			01				
A05-1A41/1C41	11	A06-1A41/1C41	11	4	A06A41			01				
A05-1A42/1C42	11	A06-1A42/1C42	11	4	A05A42			01				
A05-1A43/1C43	11	A06-1A43/1C43	11	4	A06A43			01				
A05-1B08/1D08	11	A07-1B08/1D08	11	5	A04B08			01				
A05-1B08/1D08	22	A04-1B08/1D08	22	4	A04B08			01				
A05-1B09/1D09	11	A07-1B09/1D09	11	5	A04B09			01				
A05-1B09/1D09	22	A04-1B09/1D09	22	4	A04B09			01				
A05-1B10/1D10	11	A07-1B10/1D10	11	5	A04B10			01				
A05-1B10/1D10	22	A04-1B10/1D10	22	4	A04B10			01				
A05-1B11/1D11	11	A07-1B11/1D11	11	5	A04B11			01				
A05-1B11/1D11	22	A04-1B11/1D11	22	4	A04B11			01				
A05-1B12/1D12	11	A07-1B12/1D12	11	5	A04B12			01				
A05-1B12/1D12	22	A04-1B12/1D12	22	4	A04B12			01				
A05-1B13/1D13	11	A07-1B13/1D13	11	5	A04B13			01				
A05-1B13/1D13	22	A04-1B13/1D13	22	4	A04B13			01				
A05-1B14/1D14	11	A07-1B14/1D14	11	5	A04B14			01				
A05-1B14/1D14	22	A04-1B14/1D14	22	4	A04B14			01				
A05-1B15/1D15	11	A07-1B15/1D15	11	5	A04B15			01				
A05-1B15/1D15	22	A04-1B15/1D15	22	4	A04B15			01				
A05-1B16/1D16	11	A07-1B16/1D16	11	5	A04B16			01				
A05-1B16/1D16	22	A04-1B16/1D16	22	4	A04B16			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE
A27-1A09/1C09	11	A21-1A22/1C22	11	6	A21A22			01				
A27-1A10/1C10	11	A26-2B28/2D28	11	10	A27A10			01				
A27-1A11/1C11	11	A26-1A17/1C17	11	4	A26A17			01				
A27-1A12/1C12	11	A24-2A04/2C04	11	8	A24A54			01				
A27-1A13/1C13	11	A26-1B14/1D14	11	4	A26B14			01				
A27-1A14/1C14	11	A26-1B15/1D15	11	4	A26B15			01				
A27-1A16/1C16	11	A21-1B26/1D26	11	6	A21B26			01				
A27-1A17/1C17	11	A21-1B27/1D27	11	6	A21B27			01				
A27-1A18/1C18	11	A21-1B28/1D28	11	6	A21B28			01				
A27-1A19/1C19	11	A26-1B19/1D19	11	4	A26B19			01				
A27-1A20/1C20	11	A26-1B21/1D21	11	4	A26B21			01				
A27-1A21/1C21	11	A23-2A33/2C33	11	10	A23A83			01				
A27-1A22/1C22	11	A23-1A35/1C35	11	6	A23A35			01				
A27-1A24/1C24	11	A25-1A24/1C24	11	5	A23A24			01				
A27-1A24/1C24	22	A24-2A32/2C32	22	9	A23A24			01				
A27-1A25/1C25	11	A25-1A25/1C25	11	5	A23A25			01				
A27-1A25/1C25	22	A24-2B31/2D31	22	9	A23A25			01				
A27-1A26/1C26	11	A25-1A26/1C26	11	5	A23A26			01				
A27-1A26/1C26	22	A24-2B28/2D28	22	9	A23A26			01				
A27-1A27/1C27	11	A25-1A27/1C27	11	5	A23A27			01				
A27-1A27/1C27	22	A24-2B27/2D27	22	8	A23A27			01				
A27-1A28/1C28	11	A21-1A24/1C24	11	6	A21A24			01				
A27-1A29/1C29	11	A21-1A25/1C25	11	6	A21A25			01				
A27-1A30/1C30	11	A24-1A32/1C32	11	5	A24A32			01				
A27-1A31/1C31	11	A21-1A26/1C26	11	6	A21A26			01				
A27-1A32/1C32	11	A21-1A27/1C27	11	6	A21A27			01				
A27-1A33/1C33	11	A21-1A28/1C28	11	6	A21A28			01				
A27-1A34/1C34	11	A21-1B30/1D30	11	6	A21B30			01				

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	-----	DESCRIPTION	-----	QSE
A27-1A37/1C37	11	A25-2B22/2D22	11	7	A27A37			01						
A27-1A38/1C38	11	A25-2A11/2C11	11	6	A27A38			01						
A27-1A40/1C40	11	A25-2A05/2C05	11	6	A27A40			01						
A27-1A41/1C41	11	A25-2B11/2D11	11	6	A27A41			01						
A27-1A42/1C42	11	A25-2B12/2D12	11	6	A27A42			01						
A27-1B04/----		A27-1D04/----			GRNDXX			01						
A27-1B08/----		A27-1D08/----			GRNDXX			01						
A27-1B10/1D10	11	A25-2A24/2C24	11	10	A27B10			01						
A27-1B12/1D12	22	A25-2B13/2D13	22	8	A23A71			01						
A27-1B13/1D13	11	A24-2A08/2C08	11	8	A27B13			01						
A27-1B14/1D14	11	A26-1A15/1C15	11	4	A26A15			01						
A27-1B15/1D15	11	A26-1B16/1D16	11	4	A26B16			01						
A27-1B16/----		A27-1D16/----			GRNDXX			01						
A27-1B18/1D18	11	A24-2B43/2D43	11	11	A24B93			01						
A27-1B19/1D19	11	A26-1A18/1C18	11	4	A26A18			01						
A27-1B20/1D20	11	A26-1A20/1C20	11	4	A26A20			01						
A27-1B21/1D21	11	A22-1A17/1C17	11	6	A22A17			01						
A27-1B21/1D21	22	A24-2A42/2C42	22	10	A22A17			01						
A27-1B22/1D22	11	A23-2B33/2D33	11	10	A23B83			01						
A27-1B24/1D24	11	A25-1B24/1D24	11	5	A23B24			01						
A27-1B24/1D24	22	A24-2A31/2C31	22	9	A23B24			01						
A27-1B25/1D25	11	A25-1B25/1D25	11	5	A23B25			01						
A27-1B25/1D25	22	A24-2B30/2D30	22	9	A23B25			01						
A27-1B26/1D26	11	A25-1B26/1D26	11	5	A23B26			01						
A27-1B26/1D26	22	A24-2A27/2C27	22	9	A23B26			01						
A27-1B27/1D27	11	A25-1B27/1D27	11	5	A23B27			01						
A27-1B27/1D27	22	A24-2A26/2C26	22	8	A23B27			01						
A27-1B30/1D30	11	A22-1A34/1C34	11	6	A22A34			01						
A27-1B33/1D33	11	A22-1B34/1D34	11	6	A22B34			01						
A27-1B35/1D35	11	A24-2B38/2D38	11	9	A24B88			01						

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ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	----- DESCRIPTION -----	QSE
A27-1B37/1D37	11	A25-2A04/2C04	11	6	A27B37			01				
A27-1B40/1D40	11	A25-2B05/2D05	11	6	A27B40			01				
A27-1B41/1D41	11	A25-2B04/2D04	11	6	A27B41			01				
A27-1B42/1D42	11	A25-2A12/2C12	11	6	A27B42			01				
A27-2A03/2C03	11	A25-2B28/2D28	11	6	A27A53			01				
A27-2A05/2C05	11	A24-2B22/2D22	11	6	A24B72			01				
A27-2A05/2C05	22	A25-2B41/2D41	22	6	A24B72			01				
A27-2A07/2C07	11	A25-2A07/2C07	11	5	A23A57			01				
A27-2A08/2C08	11	A25-2A08/2C08	11	5	A23A58			01				
A27-2A09/2C09	11	A25-2A09/2C09	11	5	A23A59			01				
A27-2A10/2C10	11	A25-2A10/2C10	11	5	A23A60			01				
A27-2A12/2C12	11	A24-2B42/2D42	11	6	A24B92			01				
A27-2A16/2C16	11	A26-1A28/1C28	11	7	A25A83			01				
A27-2A16/2C16	22	A25-2A33/2C33	22	6	A25A83			01				
A27-2A17/2C17	11	A24-2A30/2C30	11	6	A27A67			01				
A27-2A26/2C26	11	A25-1B14/1D14	11	9	A25B14			01				
A27-2A27/2C27	11	A25-1A18/1C18	11	9	A25A18			01				
A27-2A29/2C29	11	A25-1B16/1D16	11	9	A25B16			01				
A27-2A30/2C30	11	A25-1B21/1D21	11	9	A25B21			01				
A27-2A32/2C32	11	A26-2B04/2D04	11	6	A27A82			01				
A27-2A33/2C33	11	A26-2B22/2D22	11	5	A27A83			01				
A27-2A35/2C35	11	A26-2A11/2C11	11	6	A27A85			01				
A27-2A36/2C36	11	A26-2B05/2D05	11	6	A27A86			01				
A27-2A38/2C38	11	A26-2A05/2C05	11	6	A27A88			01				
A27-2A41/2C41	11	A22-2A03/2C03	11	7	A22A53			01				
A27-2A43/2C43	11	A23-2A24/2C24	11	6	A23A74			01				
A27-2B03/2D03	11	A24-2B33/2D33	11	6	A27B53			01				
A27-2B07/2D07	11	A25-2B07/2D07	11	5	A23B57			01				

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PAGE	122	PACK	A27 60000496 REV A										DATE 90/01/19
ORIGIN	LEVS	DESTINATION	LEVS	LTH	SIGNAL	CBL	COLORS	REV	GA	TYPE	DESCRIPTION	QSE	
A27-2B08/2D08	11	A25-2B08/2D08	11	5	A23B58			01					
A27-2B09/2D09	11	A25-2B09/2D09	11	5	A23B59			01					
A27-2B10/2D10	11	A25-2B10/2D10	11	5	A23B60			01					
A27-2B11/2D11	11	A23-2B21/2D21	11	6	A23B71			01					
A27-2B12/2D12	11	A24-2A43/2C43	11	6	A24A93			01					
A27-2B16/----		A27-2D16/----			GRNDXX			01					
A27-2B17/2D17	11	A23-2B24/2D24	11	6	A23B74			01					
A27-2B18/----		A27-2D18/----			GRNDXX			01					
A27-2B20/2D20	11	A23-2A25/2C25	11	6	A23A75			01					
A27-2B26/2D26	11	A25-1A15/1C15	11	9	A25A15			01					
A27-2B27/2D27	11	A25-1B19/1D19	11	9	A25B19			01					
A27-2B29/2D29	11	A25-1B15/1D15	11	10	A25B15			01					
A27-2B30/2D30	11	A25-1A20/1C20	11	9	A25A20			01					
A27-2B31/2D31	11	A24-1B25/1D25	11	9	A24B25			01					
A27-2B32/2D32	11	A26-2A04/2C04	11	6	A27B82			01					
A27-2B33/2D33	11	A22-2A04/2C04	11	7	A22A54			01					
A27-2B34/2D34	11	A25-1A17/1C17	11	10	A25A17			01					
A27-2B35/2D35	11	A23-2B26/2D26	11	6	A23B76			01					
A27-2B36/2D36	11	A23-2B34/2D34	11	6	A23B84			01					
A27-2B37/----		A27-2D37/----			GRNDXX			01					
A27-2B38/2D38	11	A26-2B12/2D12	11	6	A27B88			01					
A27-2B40/2D40	11	A26-2A12/2C12	11	6	A27B90			01					
A27-2B42/2D42	11	A26-2B11/2D11	11	6	A27B92			01					
A27-2B43/2D43	11	A22-2B03/2D03	11	7	A22B53			01					

Cable Tabs

The following pages contain cable tab listings for the 1940-1/2/3/10/11/12 CYBER Channel Coupler.



CABLE TABS-CCC
CYBER I/O

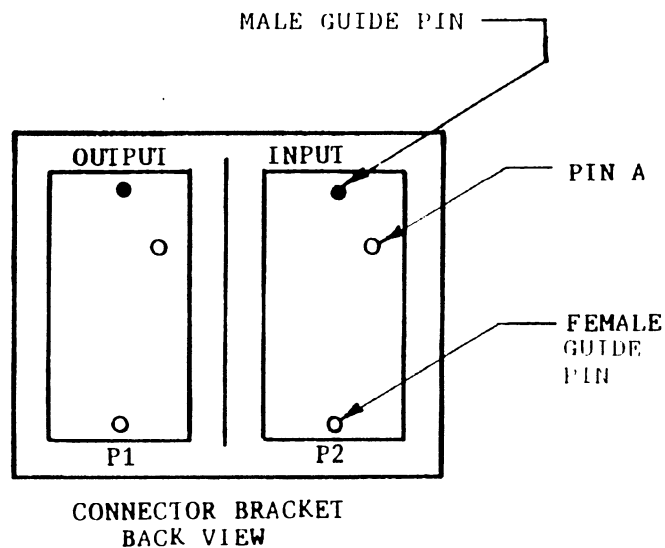
CODE IDENT

SHEET 2

A

DOCUMENT NO.
67185232

REV.
C



FR205A/FV720A CABLE PLACEMENT
REFERENCE PIN (●) LOCATION

TABLE 1	CHAN A	CHAN B
P1-J01	A01-2B18	B01-2B18
P1-J02	2B23	2B23
P1-J03	2B28	2B28
P1-J04	2B33	2B33
P1-J05	2B38	2B38
P2-J06	2A18	2A18
P2-J07	2A23	2A23
P2-J08	2A28	2A28
P2-J09	2A33	2A33
P2-J10	A01-2A38	B01-2A38

FR205B/FV720B CABLE PLACEMENT
REFERENCE PIN (●) LOCATION

TABLE 2	CHAN A	CHAN B
P1-J01	A01-2B18	A15-2B18
P1-J02	2B23	2B23
P1-J03	2B28	2B28
P1-J04	2B33	2B33
P1-J05	2B38	2B38
P2-J06	2A18	2A18
P2-J07	2A23	2A23
P2-J08	2A28	2A28
P2-J09	2A33	2A33
P2-J10	A01-2A38	A15-2A38



CABLE TABS - CCC
CYBER I/O

CODE IDENT

SHEET 3

A

DOCUMENT NO.

67185232

REV.

A

OUTPUT CABLE P1

	C	B	SIGNAL	
	GND			
	○	●	PARITY	= P2-W
	○	○	JUMPER	
J01	○	○	MASTER CLEAR	= P2-V
	○	○	FUNCTION	= P2-U
	○	○	EMPTY	= P2-T
	○	●	JUMPER	
	○	○	FULL	= P2-S
J02	○	○	INACTIVE	= P2-R
	○	○	ACTIVE	= P2-P
	○	○	JUMPER	
	○	●	DATA 11	= P2-N
	○	○	DATA 10	= P2-M
J03	○	○	DATA 9	= P2-L
	○	○	JUMPER	
	○	○	DATA 8	= P2-K
	○	●	DATA 7	= P2-J
	○	○	DATA 6	= P2-H
J04	○	○	JUMPER	
	○	○	DATA 5	= P2-F
	○	○	DATA 4	= P2-E
	○	●	DATA 3	= P2-D
	○	○	JUMPER	
J05	○	○	DATA 2	= P2-C
	○	○	DATA 1	= P2-B
	○	○	DATA 0	= P2-A

INPUT CABLE P2

	A	D	SIGNAL	
		GND		
	●	○	PARITY	= P1-W
	○	○	JUMPER	
J06	○	○	1 MHZ CLOCK	= P1-V
	○	○	10 MHZ CLOCK	= P1-U
	○	○	EMPTY	= P1-T
	●	○	JUMPER	
	○	○	FULL	= P1-S
J07	○	○	INACTIVE	= P1-R
	○	○	ACTIVE	= P1-P
	○	○	JUMPER	
	●	○	DATA 11	= P1-N
	○	○	DATA 10	= P1-M
J08	○	○	DATA 9	= P1-L
	○	○	JUMPER	
	○	○	DATA 8	= P1-K
	●	○	DATA 7	= P1-J
	○	○	DATA 6	= P1-H
J09	○	○	JUMPER	
	○	○	DATA 5	= P1-F
	○	○	DATA 4	= P1-E
	○	○	DATA 3	= P1-D
	●	○	JUMPER	
J10	○	○	DATA 2	= P1-C
	○	○	DATA 1	= P1-B
	○	○	DATA 0	= P1-A





















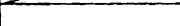


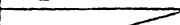

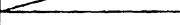
VIEWED FROM WIRE END
● = REFERENCE PIN

CONTRQ DATA CORPORATION		CABLE ASSEMBLY CYBER I/O				CODE IDENT		SHEET 4		DOCUMENT NO. 67185232		REV. 8
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) M	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS	
	1	26	9	1.5	P1	A	2,3	J05	B5	5,12	OUTPUT DATA 2 ⁰	
			0			GND			C5		GND	
			9		P1	B			B4		OUTPUT DATA 2 ¹	
			0			GND			C4		GND	
			9		P1	C			B3		OUTPUT DATA 2 ²	
			0			GND			C3		GND	
			9		P1	D			B1		OUTPUT DATA 2 ³	
			0			GND		J05	C1		GND	
			9		P1	E		J04	B5		OUTPUT DATA 2 ⁴	
			0			GND			C5		GND	
			9		P1	F			B4		OUTPUT DATA 2 ⁵	
			0			GND			C4		GND	
			9		P1	H			B2		OUTPUT DATA 2 ⁶	
			0			GND			C2		GND	
			9		P1	J			B1		OUTPUT DATA 2 ⁷	
			0			GND		J04	C1		GND	
			9		P1	K		J03	B5		OUTPUT DATA 2 ⁸	
			0			GND			C5		GND	
			9		P1	L			B3		OUTPUT DATA 2 ⁹	
	1	26	0	1.5		GND	2,3	J03	C3	5,12	GND	

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CONTROL DATA CORPORATION		CABLE ASSEMBLY CYBER I/O			CODE IDENT		SHEET 5			WL		DOCUMENT NO. 67185232		REV B	
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) m'	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS				
	1	26	9	1.5	P1	M	2,3	J03	B2	5, 12	OUTPUT DATA 2 ¹⁰				
			0			GND			C2		GND				
			9		P1	N		V	B1		OUTPUT DATA 2 ¹¹				
			0			GND		J03	C1		GND				
			9		P1	P		J02	B4		ACTIVE				
			0			GND			C4		GND				
			9		P1	R			B3		INACTIVE				
			0			GND			C3		GND				
			9		P1	S		V	B2		FULL				
			0			GND		J02	C2		GND				
			9		P1	T		J01	B5		EMPTY				
			0			GND			C5		GND				
			9		P1	U			B4		FUNCTION				
			0			GND			C4		GND				
			9		P1	V			B3		MASTER CLEAR				
			0			GND			C3		GND				
			9		P1	W			B1		OUTPUT PARITY				
	1	26	0	1.5		GND	2,3	J01	C1	5, 12	GND				


CONTROL DATA CORPORATION		CABLE ASSEMBLY CYBER I/O			CODE IDENT		SHEET 6			WL	DOCUMENT NO. 67185232	REV. <i>B</i>
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) m	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS	
	1	26	9	1.5	P2	M	2,3	J08	A2	5,12	INPUT DATA 2 ¹⁰	
			0			GND			D2		GND	
			9		P2	N			A1		INPUT DATA 2 ¹¹	
			0			GND		J08	D1		GND	
			9		P2	P		J07	A4		ACTIVE	
			0			GND			D4		GND	
			9		P2	R			A3		INACTIVE	
			0			GND			D3		GND	
			9		P2	S			A2		FULL	
			0			GND		J07	D2		GND	
			9		P2	T		J06	A5		EMPTY	
			0			GND			D5		GND	
			9		P2	U			A4		10 MHZ CLOCK	
			0			GND			D4		GND	
			9		P2	V			A3		1 MHZ CLOCK	
			0			GND			D3		GND	
			9		P2	W			A1		INPUT PARITY	
			0			GND		J06	D1		GND	
	1	26	0	1.5		GND	2,3			5,12		

CONTROL DATA		CABLE ASSEMBLY			CODE IDENT		SHEET 7			DOCUMENT NO.		REV
CORPORATION		CYBER I/O								67185232		B.
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) m	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS	
1	1	26	9	1.5	P2	A	2,3	J10	A5	5,12	INPUT DATA 2 ⁰	
			0			GND			D5		GND	
			9		P2	B			A4		INPUT DATA 2 ¹	
			0			GND			D4		GND	
			9		P2	C			A3		INPUT DATA 2 ²	
			0			GND			D3		GND	
			9		P2	D			A1		INPUT DATA 2 ³	
			0			GND		J10	D1		GND	
			9		P2	E		J09	A5		INPUT DATA 2 ⁴	
			0			GND			D5		GND	
			9		P2	F			A4		INPUT DATA 2 ⁵	
			0			GND			D4		GND	
			9		P2	H			A2		INPUT DATA 2 ⁶	
			0			GND			D2		GND	
			9		P2	J			A1		INPUT DATA 2 ⁷	
			0			GND		J09	D1		GND	
			9		P2	K		J08	A5		INPUT DATA 2 ⁸	
			0			GND			D5		GND	
1	1	26	9	1.5	P2	L	2,3		A3	5,12	INPUT DATA 2 ⁹	
			0			GND		J08	D3		GND	

AA3183 REV. 8/71

CONTROL DATA CORPORATION		CABLE TABS - CCC I/O, FIPS I/F METRIC					CODE IDENT	SHEET 2 of 9		A	DOCUMENT NO. 22120961	REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) MM	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS CHANNEL A TAG	
		26	6	1000	J01	B02		A10 2D	29		GND	
			2			B03		A10 2B	29		OPL IN	
			6			B04		A10 2C	24		GND	
			2			B05		A10 2A	24		ADR IN	
			6			B07		A10 2D	19		GND	
			2			B08		A10 2B	19		SEL IN	
			6			B09		A12 2C	28		GND	
			2			B10		A12 2A	28		ADR OUT	
			6			B13		A12 2D	21		GND	
			2			B12		A12 2B	21		SUP OUT	
			6			D05		A10 2C	21		GND	
			2			D04		A10 2A	21		STA IN	
			6			D07		A10 1D	42		GND	
			2			D06		A10 1B	42		SRV IN	
			6			D08		A12 2C	22		GND	
			2			D09		A12 2A	22		SEL OUT	
			6			D10		A11 2C	22		GND	
			2			D11		A11 2A	22		CMD OUT	
			6			D12		A11 2D	20		GND	
		26	2	1000	J01	D13		A11 2B	20		SRV OUT	


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 CONTROL DATA CORPORATION					CABLE TABS - CCC I/O, FIPS I/F METRIC		CODE IDENT	SHEET 3 of 9		A.	DOCUMENT NO. 22120961	REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX.) MM	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS CHANNEL A TAG	
		26	6	1000	J01	G02		A11 2D	21		GND	
			2			G03		A11 2B	21		CLK OUT	
			6			G04		A10 -1C	43		GND	
			2			G05		A10 -1A	43		MTR IN	
			6			G07		A10 -2D	20		GND	
			2			G08		A10 -2B	20		DAT IN	
			6			G09		A11 2C	19		GND	
			2			G10		A11 2A	19		DAT OUT	
			6			G13		A12 2C	26		GND	
			2			G12		A12 2A	26		HLD OUT	
			6			J05		A12 2D	20		GND	
			2			J04		A12 2B	20		MTR OUT	
			6			J07		A10 -2C	20		GND	
			2			J06		A10 -2A	20		REQ IN	
			6			J10		A10 2C	34		GND	
			2			J11		A10 2A	34		DIS IN	
			6			J12		A12 2C	20		GND	
			2			J13		A12 2A	20		OPL OUT	
			6			J08					GND	
		26	2	1000	J01	J07					SPARE	


CABLE TABS - CCC I/O, FIPS I/F METRIC					CODE IDENT		SHEET 4 of 9		A.	DOCUMENT NO. 22120961	REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) MM	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS CHANNEL A BUS 0
		26	6	1000	J02	B02		A13 2C	40		GND
			2			B03		A13 -2A	40		BUS 0 OUT P
			6			B04		A13 -2D	41		GND
			2			B05		A13 -2B	41		BUS 0 OUT 1
			6			B07		A13 2C	34		GND
			2			B08		A13 -2A	34		BUS 0 OUT 3
			6			B09		A13 -2D	25		GND
			2			B10		A13 -2B	28		BUS 0 OUT 5
			6			B13		A13 -2C	19		GND
			2			B12		A13 -2A	19		BUS 0 OUT 7
			6			D05		A13 -2C	42		GND
			2			D04		A13 -2A	42		BUS 0 OUT 0
			6			D07		A13 -2C	37		GND
			2			D06		A13 -2A	37		BUS 0 OUT 2
			6			D08		A13 -2C	28		GND
			2			D09		A13 -2A	28		BUS 0 OUT 4
			6			D10		A13 -2D	19		GND
			2			D11		A13 -2B	19		BUS 0 OUT 6
			6			D12		A11 -2C	28		GND
		26	2	1000	J02	D13		A11 -2A	28		MKO OUT
























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 CABLE TABS - CCC I/O, FIPS I/F METRIC					CODE IDENT		SHEET 5 of 9		A.	DOCUMENT NO. 22120961	REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) MM	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS CHANNEL A BUS 0
		26	6	1000	J02	G02		A13 -1D	03		GND
			2			G03		A13 -1B	03		BUS 0 IN P
			6			G04		A13 -1C	03		GND
			2			G05		A13 -1A	03		BUS 0 IN 1
			6			G07		A13 -1C	08		GND
			2			G08		A13 -1A	08		BUS 0 IN 3
			6			G09		A13 1D	07		GND
			2			G10		A13 1B	07		BUS 0 IN 5
			6			G13		A13 -1C	04		GND
			2			G12		A13 -1A	04		BUS 0 IN 7
			6			J05		A13 -1D	05		GND
			2			J04		A13 -1B	05		BUS 0 IN 0
			6			J07		A13 -1D	11		GND
			2			J06		A13 -1B	11		BUS 0 IN 2
			6			J08		A13 -1C	07		GND
			2			J09		A13 -1A	07		BUS 0 IN 4
			6			J10		A13 -1C	05		GND
			2			J11		A13 -1A	05		BUS 0 IN 6
			6			J12					GND
		26	2	1000	J02	J13					SPARE

CABLE TABS - CCC I/O, FIPS I/F METRIC					CODE IDENT		SHEET 6 of 9			DOCUMENT NO. 22120961		REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) MM	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS CHANNEL B TAG	
		26	6	1000	J03	B02		A242D	29		GND	
			2			B03		A242B	29		OPL IN	
			6			B04		A242C	24		GND	
			2			B05		A242A	24		ADR IN	
			6			B07		A242D	19		GND	
			2			B08		A242B	19		SEL IN	
			6			B09		A262C	28		GND	
			2			B10		A262A	28		ADR OUT	
			6			B13		A262D	21		GND	
			2			B12		A262B	21		SUP OUT	
			6			D05		A242C	21		GND	
			2			D04		A242A	21		STA IN	
			6			D07		A241D	42		GND	
			2			D06		A241B	42		SRV IN	
			6			D08		A262C	22		GND	
			2			D09		A262A	22		SEL OUT	
			6			D10		A252C	22		GND	
			2			D11		A25 2A	22		CMD OUT	
			6			D12		A25 2D	20		GND	
		26	2	1000	J03	D13		A25 2B	20		SRV OUT	

 CONTROL DATA CORPORATION		CABLE TABS - CCC I/O, FIPS I/F METRIC				CODE IDENT		SHEET 7 of 9		A	DOCUMENT NO. 22120961		REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) MM	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS CHANNEL B TAG		
		26	6	1000	J03	G02		A25 2D	21		GND		
			2			G03		A25 2B	21		CLK OUT		
			6			G04		A24 1C	43		GND		
			2			G05		A24 1A	43		MTR IN		
			6			G07		A24 2D	20		GND		
			2			G08		A24 2B	20		DAT IN		
			6			G09		A25 2C	19		GND		
			2			G10		A25 2A	19		DAT OUT		
			6			G13		A26 2C	26		GND		
			2			G12		A26 2A	26		HLD OUT		
			6			J05		A26 2D	20		GND		
			2			J04		A26 2B	20		MTR OUT		
			6			J07		A24 2C	20		GND		
			2			J06		A24 2A	20		REQ IN		
			6			J10		A24 2C	34		GND		
			2			J11		A24 2A	34		DIS IN		
			6			J12		A26 2C	20		GND		
		26	2	1000		J13		A26 2A	20		OPL OUT		
			6			J08					GND		
			2		J03	J09					SPARE		

 CONTROL DATA CORPORATION		CABLE TABS - CCC I/O, FIPS I/F METRIC				CODE IDENT		SHEET 8 of 9		A	DOCUMENT NO. 22120961		REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) MM	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS CHANNEL B BUS 0		
		26	6	1000	J04	B02		A27 2C	40		GND		
			2			B03		A27 2A	40		BUS 0 OUT P		
			6			B04		A27 2D	41		GND		
			2			B05		A27 2B	41		BUS 0 OUT 1		
			6			B07		A27 2C	34		GND		
			2			B08		A27 2A	34		BUS 0 OUT 3		
			6			B09		A27 2D	29		GND		
			2			B10		A27 2B	28		BUS 0 OUT 5		
			6			B13		A27 2C	19		GND		
			2			B12		A27 2A	19		BUS 0 OUT 7		
			6			D05		A27 2C	42		GND		
			2			D04		A27 2A	42		BUS 0 OUT 0		
			6			D07		A27 2C	37		GND		
			2			D06		A27 2A	37		BUS 0 OUT 2		
			6			D08		A27 2C	28		GND		
			2			D09		A27 2A	28		BUS 0 OUT 4		
			6			D10		A27 2D	19		GND		
			2			D11		A27 2B	19		BUS 0 OUT 6		
			6			D12		A25 2C	28		GND		
		26	2	1000	J04	D13		A25 2A	28		MKO OUT		

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 CONTROL DATA CORPORATION		CABLE TABS - I/O, FIPS I/F METRIC				CODE IDENT		SHEET 9 of 9		A	DOCUMENT NO. 22120961	REV. A
CONDUCTOR IDENT.	FIND NO.	GAUGE (REF.)	COLOR (REF.)	LENGTH (APPROX) MM	ORIGIN		ACCESS FIND NO.	DESTINATION		ACCESS FIND NO.	REMARKS CHANNEL A BUS 0	
		26	6	1000	J04	G02		A27 1D	03		GND	
			2			G03		A27 1B	03		BUS 0 IN P	
			6			G04		A27 1C	03		GND	
			2			G05		A27 1A	03		BUS 0 IN 1	
			6			G07		A27 1C	08		GND	
			2			G08		A27 1A	08		BUS 0 IN 3	
			6			G09		A27 1D	07		GND	
			2			G10		A27 1B	07		BUS 0 IN 5	
			6			G13		A27 1C	04		GND	
			2			G12		A27 1A	04		BUS 0 IN 7	
			6			J05		A27 1D	05		GND	
			2			J04		A27 1B	05		BUS 0 IN 0	
			6			J07		A27 1D	11		GND	
			2			J06		A27 1B	11		BUS 0 IN 2	
			6			J08		A27 1C	07		GND	
			2			J09		A27 1A	07		BUS 0 IN 4	
			6			J10		A27 1C	05		GND	
			2			J11		A27 1A	05		BUS 0 IN 6	
		26	6	1000	J04	J12					GND	
			2			J13					SPARE	

Cable Tabs

CYBER Channel Trace Tables

A

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CYBER Channel Trace Tables

A

This appendix contains trace table information for channel and op-code functions.

The microcode for the CYBER channel side of the CYBER Channel Coupler (the coupler) writes a four-word trace during all normal operations. Normal operations include CYBER function codes and operation (Op) codes received from the internal processor. When an error is detected, the trace is changed to eight words and the error code and three additional information words are written into the trace and are displayed on the maintenance panel of the coupler.

Trace Memory Locations

The trace for the CYBER side resides in the coupler memory at locations $1E00_{16}$ through $1EFF_{16}$. These memory locations are used as follows.

Hex Location	Content	Description
1E00	1E08	Starting trace address
1E01	00F0	Trace length
1E02	xxxx	Next trace address
1E03	xxxx	Remaining trace length
1E04	0000	Microcode revision
1E05	0000	Microcode revision
1E06	0000	Microcode revision
1E07	0000	Microcode revision
1E08	xxxx	Trace
⋮	⋮	⋮
1EFF	xxxx	Trace

Channel Function Trace Format

The trace format for channel functions is shown in figure A-1. The status word (word 3) indicates if an additional four words are added for an error trace.

Normal Trace for Channel Functions			Error Trace for Channel Functions		
Word	Trace	Description	Word	Trace	Description
1	8xxx	Channel function	1	8xxx	Channel function
2	xxxx	Control flags	2	xxxx	Control flags
3	0000	Trace status	3	8000	Trace status
4	00xx	Status	4	00xx	Status
-	-	-	5	1xxx	Error code
-	-	-	6	xxxx	Information 1
-	-	-	7	xxxx	Information 2
-	-	-	8	xxxx	Information 3

Figure A-1. Channel Function Traces

Word 1 – Channel Function

Channel function is a 12-bit CYBER function code that shares the same contents as location 0023₁₆.

Word 2 – Control Flags

Control flags provide internal hardware status to the microcode.

Bit	Description
00	Not character fill
01	Active or pause
02	R2 register full
03	X1 register full
04	Op-code altered
05	OK to disconnect
06	Memory DB register full
07	Channel parity error
08	Memory parity error
09	Deadman timeout
10	Function
11	Microcode master clear
12	Length equals zero
13	DMA complete
14	Processor running
15	Processor abnormal

Word 3 - Trace Status

Trace status bits are defined as follows.

Bit	Description
00 or 01	Channel function
00	Error trace
01	Op-code trace
02 - 15	Not used

Word 4 - Status

Status is read from location 0024₁₆. The status bits are defined as follows.

Bit	Description
00	Not used
01	Not used
02	Interaction quicklook complete
03	CYBER quicklook complete
04	Not used
05	Not used
06	Not used
07	Not used
08	Normal end
09	Channel parity error
10	Memory parity error
11	Deadman timeout
12	Control package memory parity error
13	Transfer indicator
14	Character fill
15	Not used

Word 5 - Error Code

Refer to tables A-1 and A-2 for error codes for normal operations and quicklook errors.

Word 6, 7, 8 - Information 1, 2, 3

Words 6, 7, and 8 contain information 1, 2, and 3, respectively. These words vary with the error code (refer to tables A-1 and A-2).

Op-Code Function Trace Format

The trace format for op-code functions is shown in figure A-2. The status word (word 3) indicates if an additional four words are added for an error trace.

Normal Trace for Op-Code Functions			Error Trace for Op-Code Functions		
Word	Trace	Description	Word	Trace	Description
1	xxxx	Op-code	1	xxxx	Op-code
2	xxxx	Address	2	xxxx	Address
3	4000	Trace status	3	C000	Trace status
4	00xx	Status	4	00xx	Status
-	-	-	5	1xxx	Error code
-	-	-	6	xxxx	Information 1
-	-	-	7	xxxx	Information 2
-	-	-	8	xxxx	Information 3

Figure A-2. Op-Code Function Traces

Word 1 – Op-Code Function

This word is the op-code command read from location 0020₁₆.

Word 2 – Address

Address is read from location 0021₁₆.

Word 3 – Trace Status

Trace status bits are defined as follows.

Bit	Description
00 or 01	Channel function
00	Error trace
01	Op-code trace
02 - 15	Not used

Word 4 - Status

Status is read from location 0024₁₆. The status bits are defined as follows.

Bit	Description
00	Not used
01	Not used
02	Interaction quicklook complete
03	CYBER quicklook complete
04	Not used
05	Not used
06	Not used
07	Not used
08	Normal end
09	Channel parity error
10	Memory parity error
11	Deadman timeout
12	Control package memory parity error
13	Transfer indicator
14	Character fill
15	Not used

Word 5 - Error Code

Refer to tables A-1 and A-2 for error codes for normal operations and quicklook errors.

Word 6, 7, 8 - Information 1, 2, 3

Words 6, 7, and 8 contain information 1, 2, and 3, respectively. These words vary with the error code (refer to tables A-1 and A-2).

Table A-1. Error Codes/Normal Operations

Hex Error Code	Info. 1	Info. 2	Info. 3	Status	Misc.	Description
1101	DB Rgtr	Adrs Rgtr	Len Rgtr	0020	DB Rgtr word with parity error	Memory parity error
1102	DB Rgtr	Adrs Rgtr	Len Rgtr	0008	DB Rgtr word with parity error	Control package memory parity error
1103	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	DB Rgtr word with parity error	Trace length is 0
1104	R Rgtr	Adrs Rgtr	Len Rgtr	0040	DB Rgtr word with parity error	Channel parity error
1105	R Rgtr	Adrs Rgtr	Len Rgtr	0010	DB Rgtr word with parity error	Deadman timeout
1106	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	DB Rgtr word with parity error	Trace length is 0 at location 1E01
1107	R Rgtr	Adrs Rgtr	Len Rgtr	0040	DB Rgtr word with parity error	Channel FCN, parity error

Table A-2. Quicklook Errors

Hex Error Code	Info. 1	Info. 2	Info. 3	Status	Misc.	Description
1301	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length not 0
1302	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length is 0
1303	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length not 0
1304	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length is 0
1305	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length not 0
1306	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length is 0
1307	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length is 0
1308	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length not 0
1309	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length is 0
1310	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 0	Length not 0
1311	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 1	Length is 0
1312	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 1	Length not 0
1321	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 2	First Pop instruction failed
1322	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 2	Second Pop instruction failed
1323	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 2	Third Pop instruction failed
1323	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 2	Fourth Pop instruction failed

(Continued)

Table A-2. Quicklook Errors (Continued)

Hex Error Code	Info. 1	Info. 2	Info. 3	Status	Misc.	Description
1325	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 2	Length not 0
1331	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 3	UDI bit test failed
1332	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 3	UDI shift 4 failed
1333	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 3	UDI shift 8 failed
1334	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 3	UDI shift 12 failed
1334	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 3	UDI bits 12 - 15 PROM data and bit test
1336	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 3	UDI SH = 4 PROM data and bit test
1337	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 3	UDI SH = 8 PROM data and bit test
1338	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 3	UDI SH = 12 PROM data and bit test
1341	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 4	UDI check A/D clock 1110
1342	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 4	UDI check A/D clock 1101
1343	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 4	UDI check A/D clock 1011
1344	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 4	UDI check A/D clock 0111
1345	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 4	UDI check A/D clock 0001
1346	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 4	UDI check A/D clock 0010
1347	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 4	UDI check A/D clock 0100

(Continued)

Table A-2. Quicklook Errors (Continued)

Hex Error Code	Info. 1	Info. 2	Info. 3	Status	Misc.	Description
1348	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 4	UDI check A/D clock 1000
1351	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 5	UDI check bit set/clear, bits 12 - 15
1352	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 5	UDI check bit set/clear, bits 8 - 15
1361	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Section 6	UDI check register file
1371	DB Rgtr	Adrs Rgtr	Len Rgtr	0008	Interaction quicklook	Control package memory parity error
1372	DB Rgtr	Adrs Rgtr	Len Rgtr	0020	Interaction quicklook	Memory parity error
1373	DB Rgtr	Adrs Rgtr	Len Rgtr	0000	Interaction quicklook	Length not 0 after memory read to register file and register file read to memory write

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